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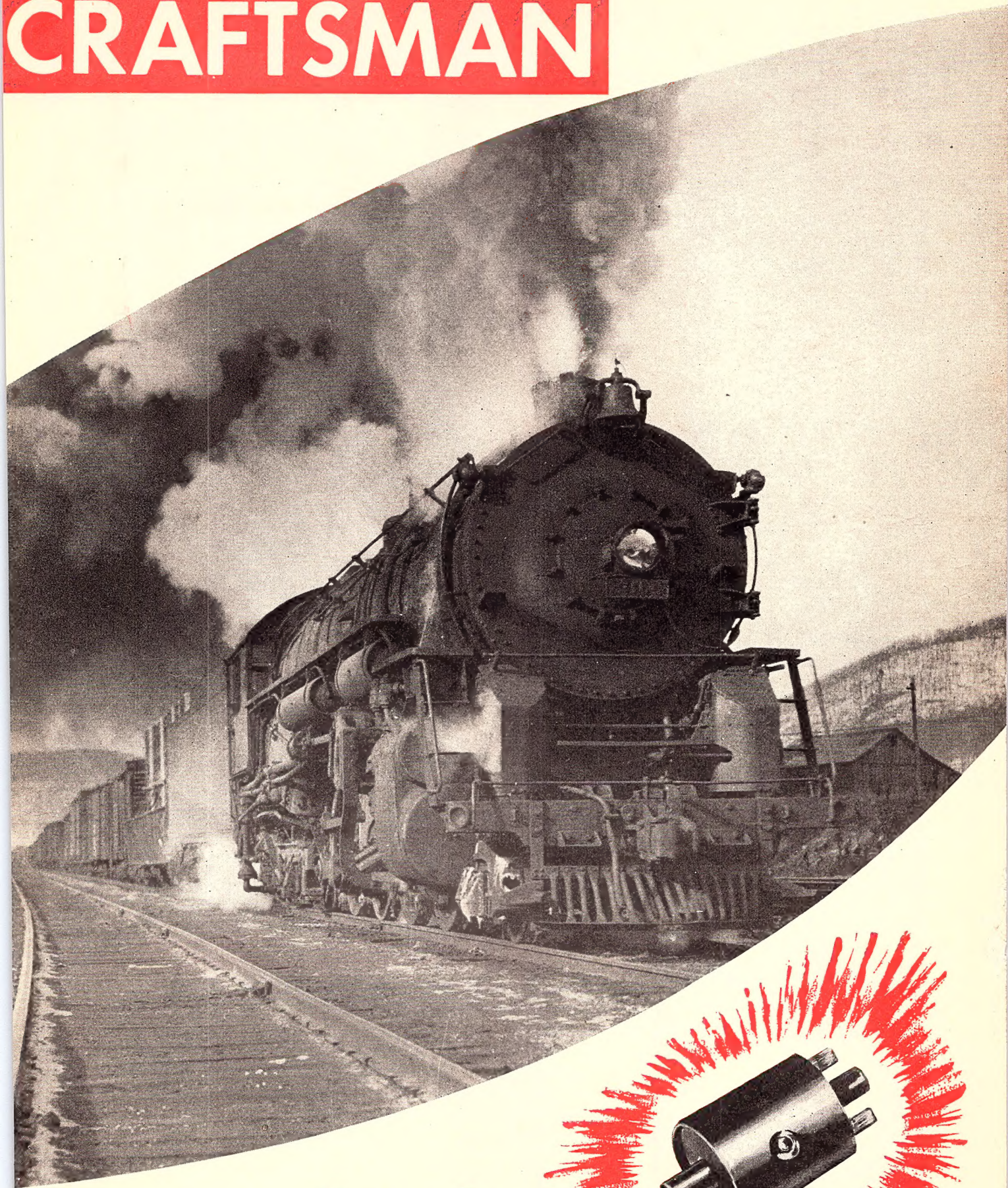

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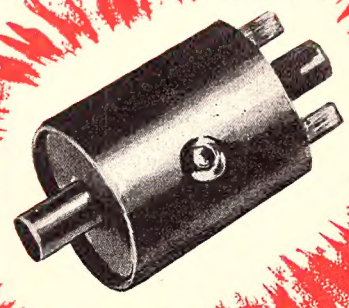

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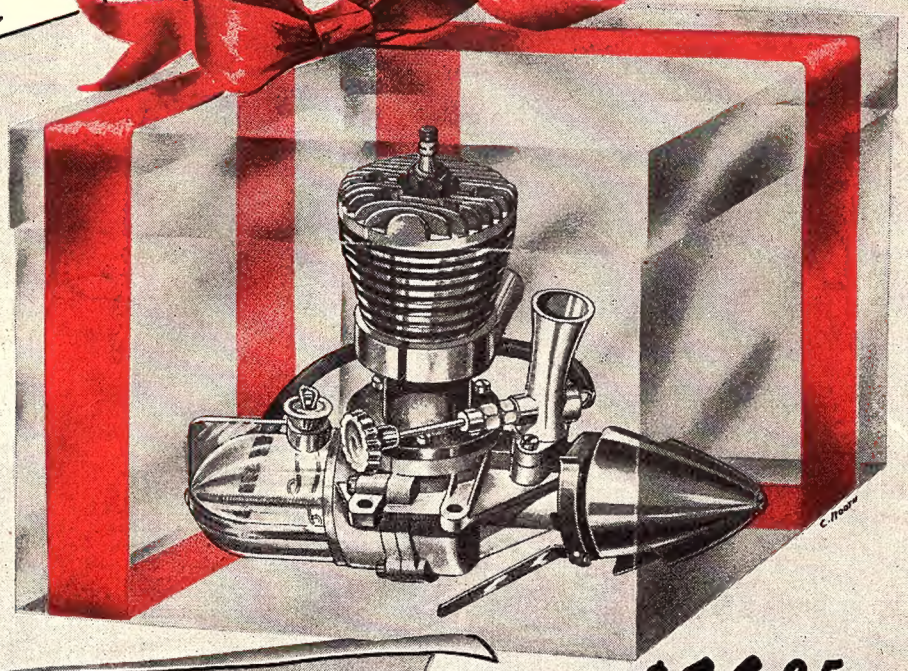

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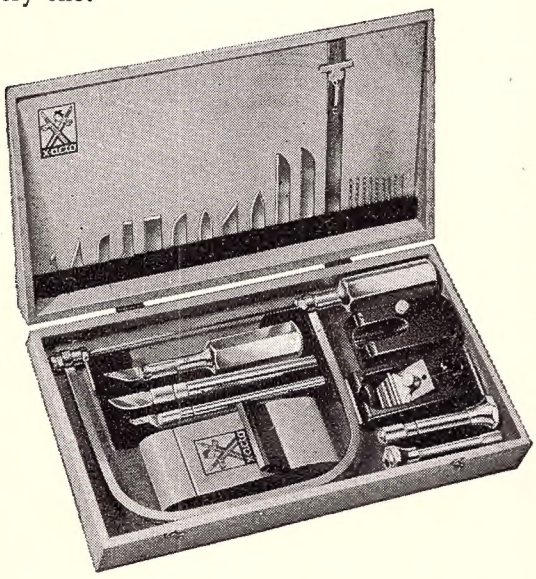

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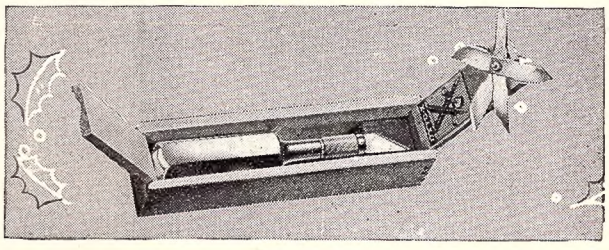

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RAILROAD CLUB NEWS

WETHERSFIELD, CONN. A new HO club has been recently formed for fans in the Wethersfield area called the Nutmeg Model Railroad Club. George Flenke has been appointed as temporary chairman, also assisting in the work as secretary along with William Edwin. The boys are now meeting every two weeks at the member homes while dickering for suitable floor space for their club layout. Work should start in another month. Good luck, fellas!

GALION, OHIO. Last month, we announced the moving of the Crooked Short Lines and Kansas Central RR from Abilene, Kansas, destination unknown. Now we hear that the owners of these roads have taken root at 131 3rd Ave., Galion, Ohio, and are again pursuing their favorite hobby of railroading in miniature.

NEW YORK, N. Y. The housing shortage is really hitting home, forcing a Railroad to move its trackage. "Number one", de luxe miniature passenger train of the Union Connecting Railroad, runs through "HC" interlocking-plant before entering passenger yard for the last time (*see photo*). Clark Pool, Chairman of the N. Y. Society of Model Engineers, acts as towerman while other members wait with wrecking equipment to dismantle the entire road after the last wheel clicks over the switches.

The Society has been forced to move from its present quarters at 51 W. 35th St., N. Y., N. Y. New locations are being investigated and, for the third time in seven years, this well-known model railroad will be rebuilt with more trackage, improved signalling and control devices, and more realistic scenery.

SANTA BARBARA, CALIF. Real railroad atmosphere now highlights the regular business meetings of the Channel Railroad Club, for the boys have just become the proud owners of an ancient crummy which once rode the Yosemite Valley Road. Purchase was made back in August of this year and the gang was then faced with the problem of moving one caboose with a badly deteriorated under-

(*Continued on page 44*)

THE MODEL CRAFTSMAN

Including "THE MODELMAKER"—Est. 1924 and MINIATURE RAILROADING Magazine

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DECEMBER, 1946 Vol. 15, No. 7

ARTICLES ARE OKAY

I've been a follower of your magazine for many years, and feel that your selection of articles fills the bill okay particularly when we consider the three fields covered in MC. Personally however, I would like to see more articles on the electrical functions of model railroading with the idea of the beginner in mind. Why not get Bartholomew to do a series of articles for the novice? . . . *B. Gorden, Cleveland.*

NEEDS HELP

Although I've been reading Model Craftsman for a few years, and I enjoy it very much, I am a beginner in Model Railroading. I like HO because of the lack of space available. I have just laid my first "Main Iron" and I've a feeling that my layout is not going to be "up to snuff". Won't you please try to publish more articles on HO Layouts. It's pretty tough getting started when you've never really seen a good HO layout. The name of my pike will be the "East Valley Central". The space I have available is about 12′ x 7′ and I hope you can help me out on a simple but effective layout idea. Keep up the fine work in your mag. . . . *J. Saro, Brooklyn, N. Y.*

(*We have a series in mind to cover this very point. . . . Ed.*)

FORGETTING SOMETHING?

Trains are not the only means of transportation on most railroader's pikes. Many times there is a bus or trolley line. I would like to know where the bus and trolley plans are. There are many types of busses and trolleys which many of us would appreciate having on our pike. . . . *J. Hoschek, Jr., Trenton.*

(*We have been running many bus and trolley plans right along but will be most willing to publish some particular type at your suggestion. . . . Ed.*)

DARN LUCKY

The engine survey was excellent—let's have more of that type of thing. As for the boys who crab about the mag, I think they are darn lucky to have a magazine which covers so many model lines. I like all types of modeling and the magazine suits me fine. . . . *W. Treadway, Bristol, Conn.*

WANTS MORE DOPE

I am a Steam Engine Builder of years ago. When you publish a cut or line drawing, please publish the Builder's dimensions, cylinder valves, steam ports, etc., that will help us poor devils in constructing a steam loco. We can cut down to any gauge. Also, where to buy castings in the rough. . . . *George Derry, Troy, N. Y.*

FRONT COVER

Erie Railroad fast freight (2-8-4 Berkshire) running into the yards at Susquehanna, Pa. Photo through the courtesy of Erie Railroad.

Merry Christmas and a Happy New Year

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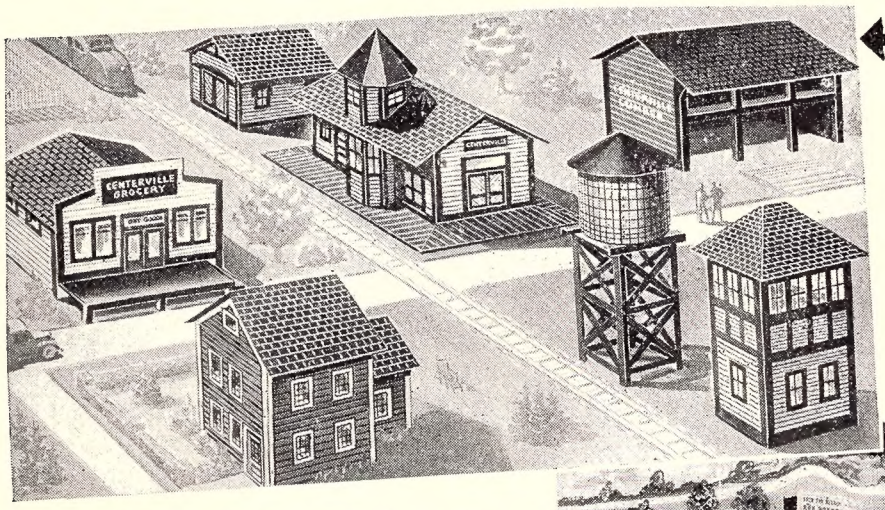

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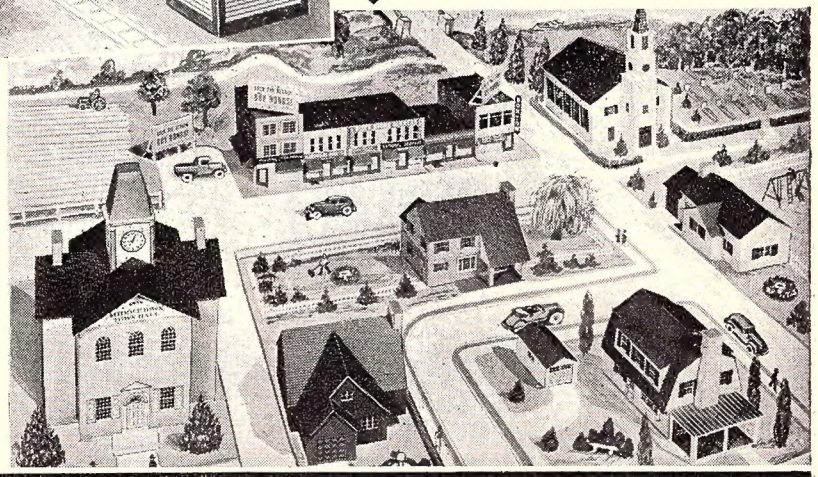

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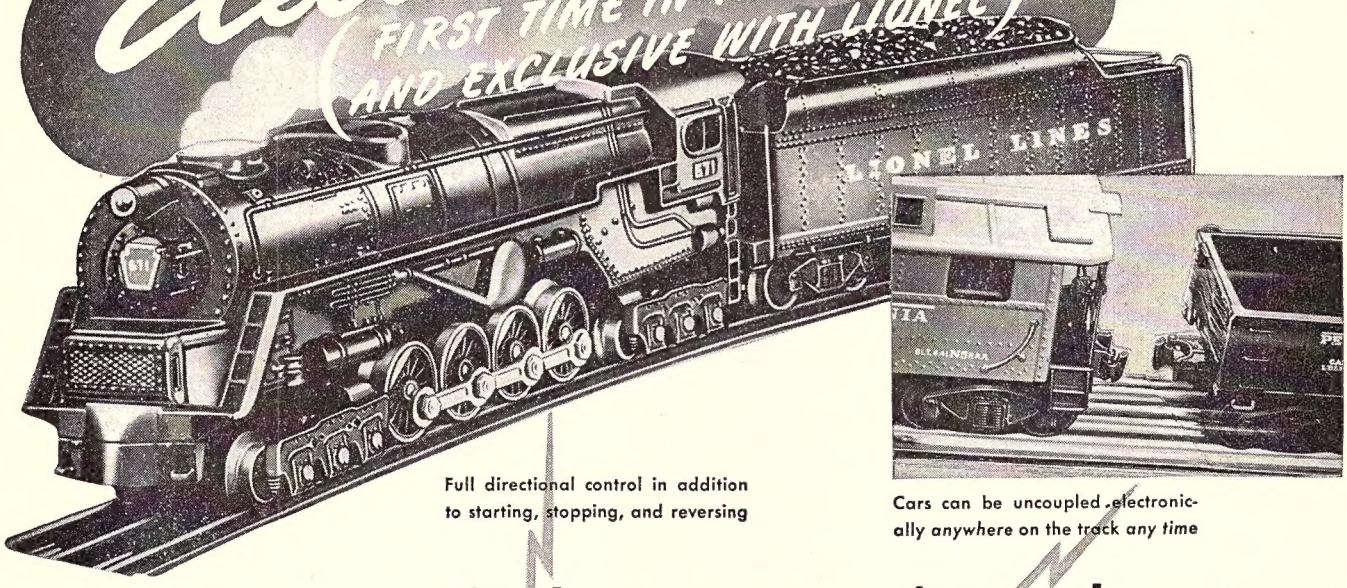

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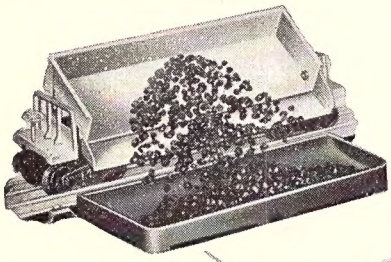

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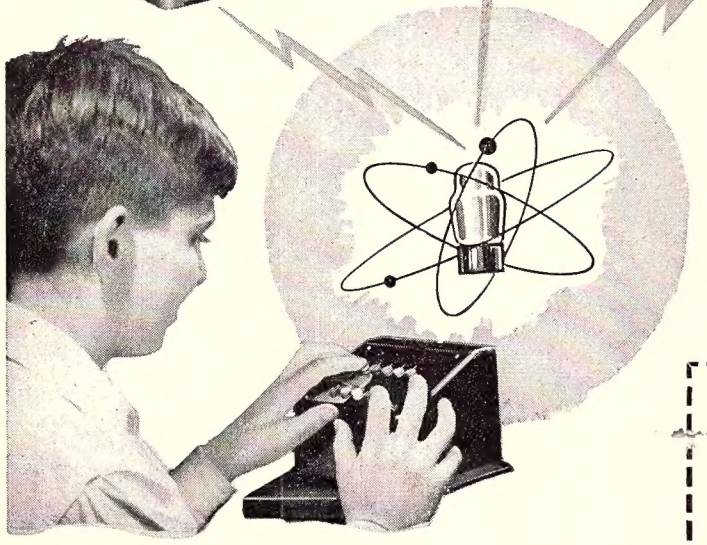

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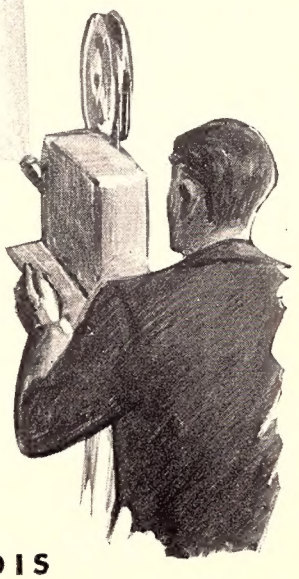


TESTOR CHEMICAL COMPANY, ROCKFORD, ILLINOIS

Two Rail Signals AT A PASSING SIDING

By CHARLES M. HUNTER

ONE of the problems encountered in model railroad signal practice is that involving two-rail signals at passing sidings. Contacts with other rail fans have revealed that the objective desired was the preservation of the two-direction principle. The circuit shown illustrates how this may be accomplished.

Fig. 1 shows the connection of the relays to the track circuit. Note that the outside rails of both main line and siding are connected to the relays, but that the inside rails are not. This becomes possible as the frogs of the track switches act as interposing switches and thus the relays connected to the outside rail are used by the inside rails also.

The relays connect in each block, when energized, open their contacts so as to de-energize a section two positions removed. The relays connected to the lower rail de-energize sections to the right, while those joined to the upper rail de-energize sections to the left.

Fig. 1 also shows solenoids and arms of semaphore signals connected to three sections of track A, B and C. Note that solenoids A and B are arranged to hold the blade of the semaphore to CLEAR when energized and that solenoid C holds the blade to CLEAR when de-energized. Sections D and E should be connected the same as A and B, while sections F, G, and H are connected the same as C.

Let's study the action of the combined series relay and solenoid circuit. With track switch #1 (TS 1 on plan) thrown as in Fig. 1, solenoid B would be de-energized, as the feed lines to it are both of the same polarity. Thus the plunger would pull the blade down and give a STOP signal for *right to left* travel on track B, because of the switch set against travel on track B. At the same time, solenoid A receives power from relay 8 and the lower rail, becoming energized; the plunger is pulled up and this pulls the signal blade to CLEAR, indicating the track is "clear" for *right to left* travel on track A.

Now suppose that simultaneously a train was on section F; relay #1 will be energized and will deactivate the lower rail at B. This also de-energizes solenoid A and provides a STOP signal for track A, also stopping train as the lower rail at A is fed through TS1 frog from the lower rail at B.

For another example, suppose we throw TS1 to permit travel from *right to left* out of B. This will place the same polarity on solenoid A, as the feed would be from relay 8 contact through relay 10 coil to the upper rail at A, through frog to solenoid A. The opposite terminal of solenoid A goes to the contact at relay 8; also the semaphore at A will be at STOP. Solenoid B will now be energized and hold the B semaphore to CLEAR. Further, a train at F will stop a train at B.

A train passing over B or A from *right to left* will stop a following train at C, energizing the solenoid C and resulting in a STOP signal, the solenoid at C being arranged differently as shown.

Naturally, the signals at D and E sections would be for *left to right* travel and would have to be connected to the relays joined to the upper rail in like manner as those at A and B. On single sections C, F, G and H there would be two signals at the end of each section, one for each direction of travel. Thus the signal at G for *left to right* travel would be controlled from relay 9 and that at F from relay 10 (on upper rail in diagram). Semaphores at A and B and also D and E should be on the same mast.

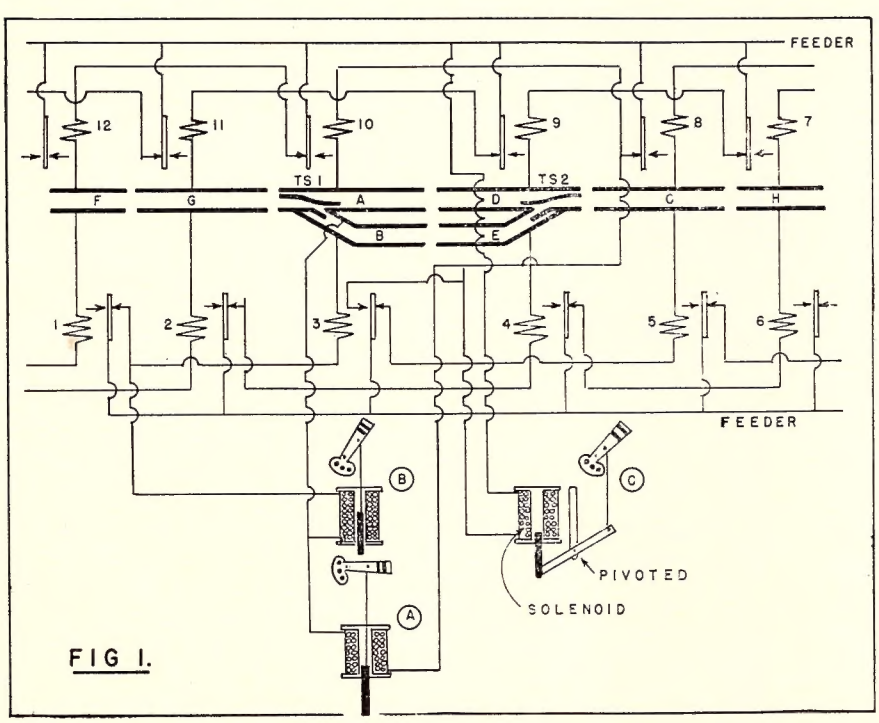


FIG 1.

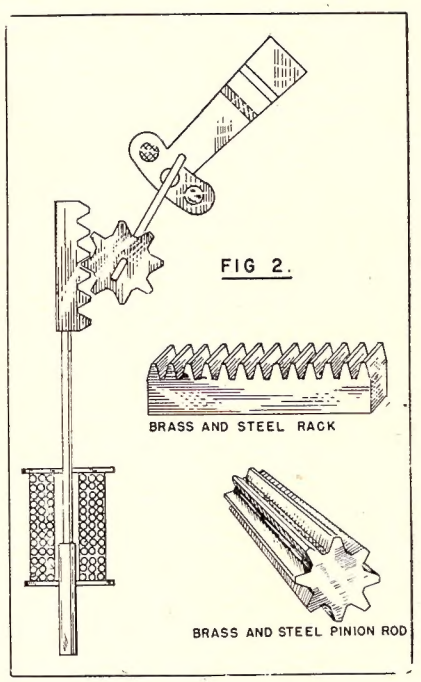


FIG 2.

Several semaphore kits in HO and O gauge are available on the market, but for those who make their own, here are a few tips. Pinion rod and gear rack are obtainable from gear works or hobby dealers. To make a small pinion, simply cut off a piece of the pinion rod and drill a hole through the center of desired size. Gear rack as small as ⅛" by ⅛" is available. Sketch shown in fig. 2 shows how a solenoid may be arranged to move the rack member up and down, which in turn revolves the pinion gear to which the semaphore arm is attached. This idea may be used with choke controls to turn the switch target at the same time the switch is changed.

Four-wheel Crummy

. . . . . a slick little Narrow Gauge Caboose for you O-Gauge fans!

By JOHN R. BARKLEY

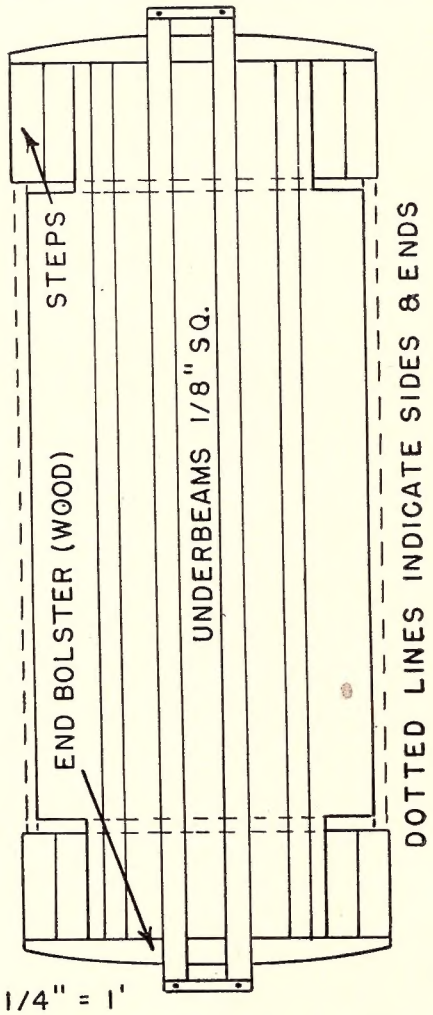
THE prototype of this little caboose is now running on the Colorado & Southern. My HO activities were sidetracked long enough to build this narrow gauge model for Mark Swerdfeger, and is one of the cutest models I've ever built. It is true to prototype except for a minor change in the stove-pipe or stack and a simplification of the window design. While plans are drawn to O Narrow Gauge, there is no reason for not building it in your favorite gauge by converting the dimensions.

Cut out the floor from a piece of 1/8th inch wood, notch the corners for the steps and set aside temporarily. Next lay out the sides and ends, preferably on 1/8" plywood, with the grain of the wood running up and down. Note that the overlap at the corners permits the sides to fit over the ends. Cut out window and door openings; scribe the wood at 1/16" intervals with a fairly dull scriber or ice pick. Cut both sides and ends from the wood, fit in place on the floor and cement firmly. Underbeams are cut from 1/8" square wood and cemented to the floor. The two center beams project beyond the ends to form the coupler pockets (this detail is covered later). Now build up steps and platforms, made from tin or brass. The sketch shows how to lay out the unit on one piece of tin, cut and bend so that soldering is only necessary on the side pieces to the steps. With a platform and steps properly bent, lay the piece on top of a side and solder from the underneath and back of the steps. These assemblies should fit snugly over the wooden floor. Platforms on the prototype are made of wood, so if you wish, the metal may be scribed crosswise to represent planking. A couple of small bank pins in each platform plus cement will hold them firmly in place.

End bolsters are made up from wood and fastened with cement and bank pins. Before installing, drill holes for the railing, six in each bolster as shown. After installation, finish the coupler pockets. Scribe a piece of 1/8" x 3/16" wood for each to represent two pieces of timber (see end view). Drill the four tiny holes and fasten with four bank pins to the bolsters. Use round headed pins to resemble bolt heads. A piece of tin is then cut and fitted around from the bottom of the two center beams with a bank pin on each side to complete the pocket. Railings are bent to shape from wire. Install those on the caboose end first. A fine pick is used to locate and start the holes so that the rails will have a force fit. Put the curved ones on the sides and then bend up the end railings. One little spot of solder will fasten the center post of each unit to the top of the cross rail.

Make up the roof from 1/8" wood. Before rounding it, fasten the 1/4" pieces to the inside so they will just fit inside car sides and ends. These may also be utilized for holding the roof in the vise while using rasps to shape to proper contour. Finish with coarse and then fine sandpaper. Add a coat of filler paint and when dry, sand well. The cupola comes next, made of tin. Lay out sides and ends on one piece of metal, including window openings. Place in vise so that the windows are above the jaws and even with the scribed line. Using a sharp 1/4" wood chisel started at an angle, cut along the line by tapping the chisel lightly with a small hammer. Make all cuts on that side; reverse the piece in vise and cut the parallel lines. After completing them, make the cross cuts, keeping the window openings above the vise jaws on each cut. True cuts with a fine file while remaining in vise. Cut the sides and ends apart with tin snips, and flatten by tapping lightly while on flat surface.

Make up a square jig by nailing one small block of wood to a flat piece. Lay one of the sides down on the flat piece, butting one end to it against the block to form the right angle, and flow solder into the inside corner. When attaching the other end, make certain the bottom edge is parallel to that of the first, as well as being at right angles to the side. Attach the remaining side and go on to the roof. Notice its slight arc, easily produced by bending the tin around something of similar arc or diameter. Solder the roof to the side assembly, doing all work from the inside. Rain guards over each side window are narrow strips of tin bent at roughly 60° along one edge and soldered just under the roof underhang. Tin these pieces lightly, apply flux and hold them in place with a pair of long-nosed pliers while running the iron along the joint. Only two pieces of wire are used for the railings around the cupola roof. These are supported at the corners by a long straight pin projecting up through the roof through a drilled hole with the sharp point projecting about 1/8" below the cupola side. Pins are sol-



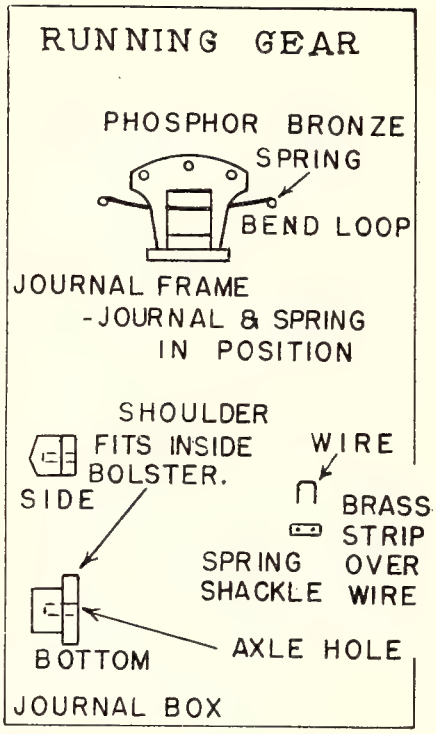
BOTTOM VIEW FLOOR

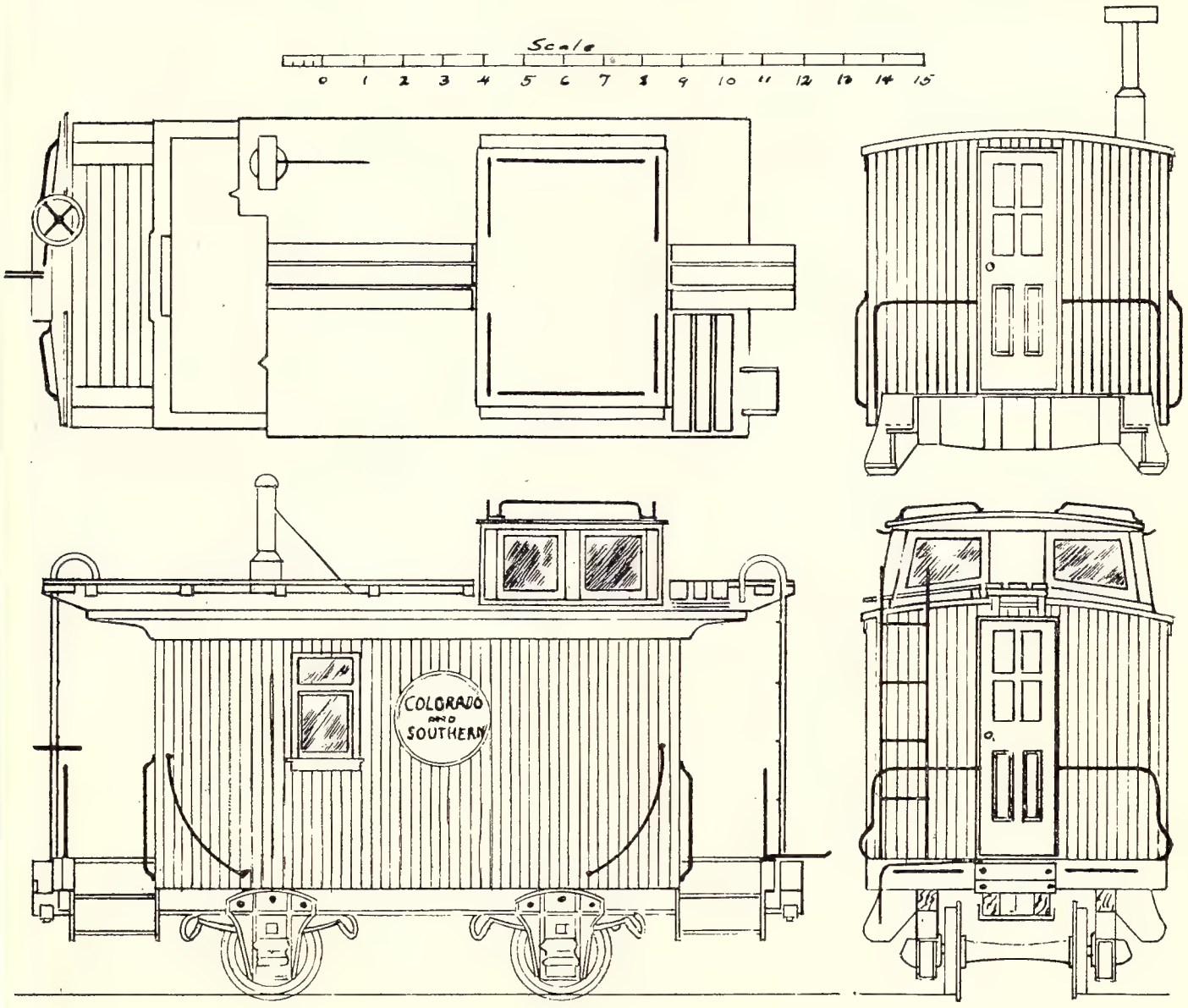
dered into the corners from the inside, making the cupola removable. Two fine saw cuts across the caboose roof allow the straight ends of the cupola to set down and apparently conform with roof curvature.

With the cupola temporarily in position, cut out the roof walk supports, seven for the roof walk and four under the end walks. Cut from 1/16" square wood and cement in position. Walks are made from 1/32" x 1/8" pine, cemented to the supports leaving just a little space between each "plank." Cut a piece of the same wood for the cross brace at each end and cement underneath the walk. End supports are cut from tin, two for each end, 1/16" wide. They are long enough to be fastened to the cross brace and bent down to go under the roof end. Drill a small hole in each end and attach with small brads. The stove pipe was made from a brass turning on our model, but one closer to prototype can be made from a brass rod or large nail with a tin hood bent in a half circle and soldered on top. The brace is a wire soldered into a hole, bent down and pushed into a hole in the caboose roof. Ladders are commercial O-Gauge stock with a section of paper clip wire soldered inside each side member and bent over at the top where it fits into a hole in the caboose roof. This makes the ladders removable with the roof. If your model is to be lighted, drill a 1/2" hole in the caboose roof inside the cupola, allowing light from the caboose to be reflected up into the cupola. Door and window frames are cut from bristol board and cemented inside. This completes the car body.

The running gear is really tricky on this little car. Mark had someone make up the castings and it has full working and sprung journals. The spring is a narrow strip of phosphor bronze bent at each end around a pin through the spring shackles. Thirty-inch wheels are used, insulated on one side for two-rail. Journal box frames are riveted to a side frame which has the spring hangers cast integrally with the unit. These side members are attached to the outside underbeam by bank pins and cement. If you are interested in these details, write in care of this magazine to get in touch with Mark. If you wish to build your own, however, follow this procedure. Cut the side members from a piece of 1/8" brass with both a hack saw and jeweler's saw. Use the jeweler's saw to cut around the

(*Continued on page 45*)





Down on the Farm

By RAYMOND OVRESAT

HOW about a little "homey atmosphere for your layout?" Most of you have the usual standard buildings that are necessary for a complete pike, but why not try to add extra life to the scene with a good old-fashioned farm? You can almost start your farm as grandpa did years ago. He started with the house—the first building to be constructed on his farm. This was really rugged when he first moved in, for it only had rough siding. And then his barn went up, quite an ambitious project, and poor grandpa had to borrow every penny he could, in order to finance it. But he certainly was proud of it, for it was different from any barn in his neighborhood. Like most farmers in his day, he never got around to actually painting it. The milkhouse and outhouse were both built from leftover lumber.

The next spring, a stucco job was done on the house to stop those terrible drafts in the winter. When harvest time approached, a new shed was built, and again it was never painted. Time passed rather quickly now, and the effects of the weather became more and more apparent on the buildings. Then, on a hot autumn day, the shed caught fire and practically burned to the ground. A new shed was built the next year, but true to tradition, grandpa never found time to tear down the burnt shed. Someday he hoped to build a new house, and give the barn some much needed repairs. Some of his land still needed fencing, his pump never did work properly, and . . .

Get the idea—a typical, weather-beaten farm, neglected in spots, junk left laying around . . . in brief, a down-to-earth, realistic addition for your layout!

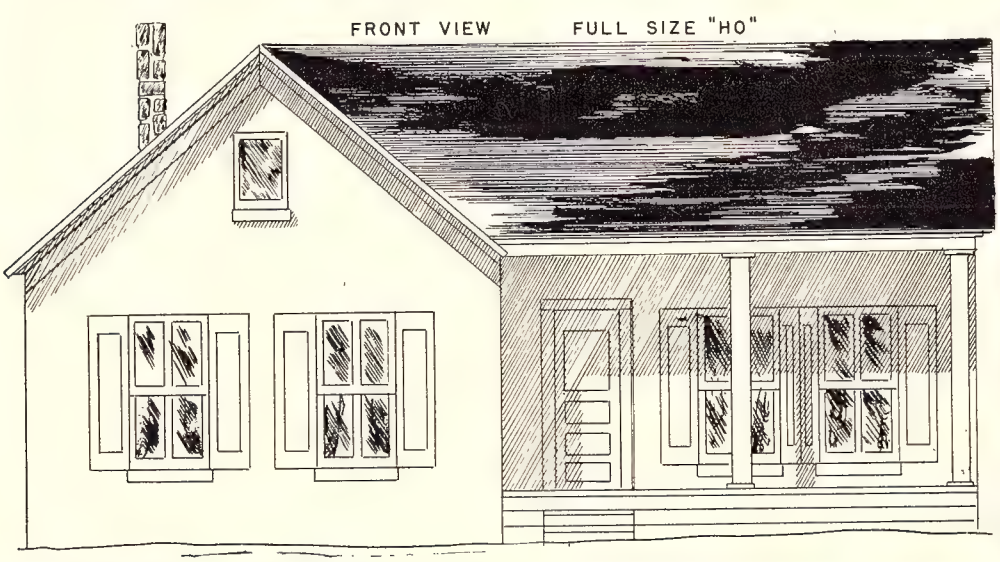
THE HOUSE—Start construction by laying out the walls on a good grade cardboard. Cut out the door and window openings as well as the walls themselves and assemble.

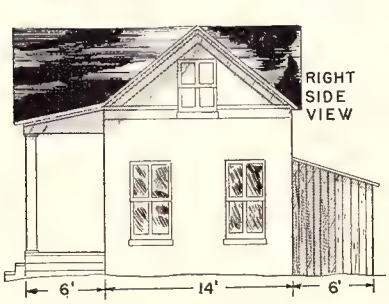
Before going any further, the walls should be painted. First give them a coat of white tempera paint. After this has dried, apply a thick coat of buff. Use the end of the brush and stipple the painted surface while it is still wet. This will represent the stucco finish. When completely dry, lightly rub a lead pencil over the entire surface. Now rub your thumb over this portion and you will have a wall surface that actually looks aged!

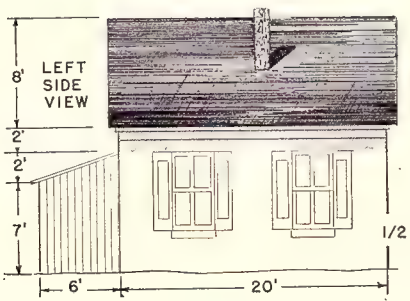
Make up window sashes, shutters and cornice work from filing card stock. Paint them a shabby brown and glue in place. Back up the window sashes with celluloid, window shades and maybe curtains. Build up the porch and glue in place. This too, is to be painted brown.

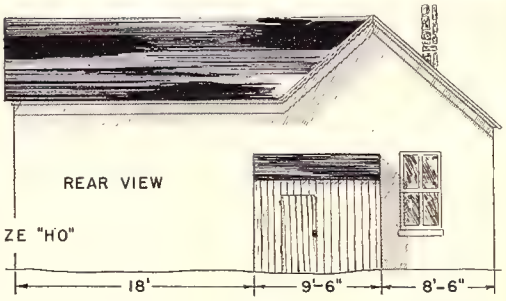
Roofing is made of filing card, using wooden ridges to create the warp desired. Paint black and indicate the tar paper seams with a thin line of light gray paint. Add the chimney and the little lean-to on the rear of the house. Any time you're ready, Grandpa can move in.

THE BARN—The weather isn't very kind at times. It seems to enjoy twisting walls and warping roofs, maybe it just can't stand anything new. Well Grandpa's barn has seen lot's of rough weather, but it is still in use, and showing its age badly. But it has been part of the landscape for some time and will probably re-



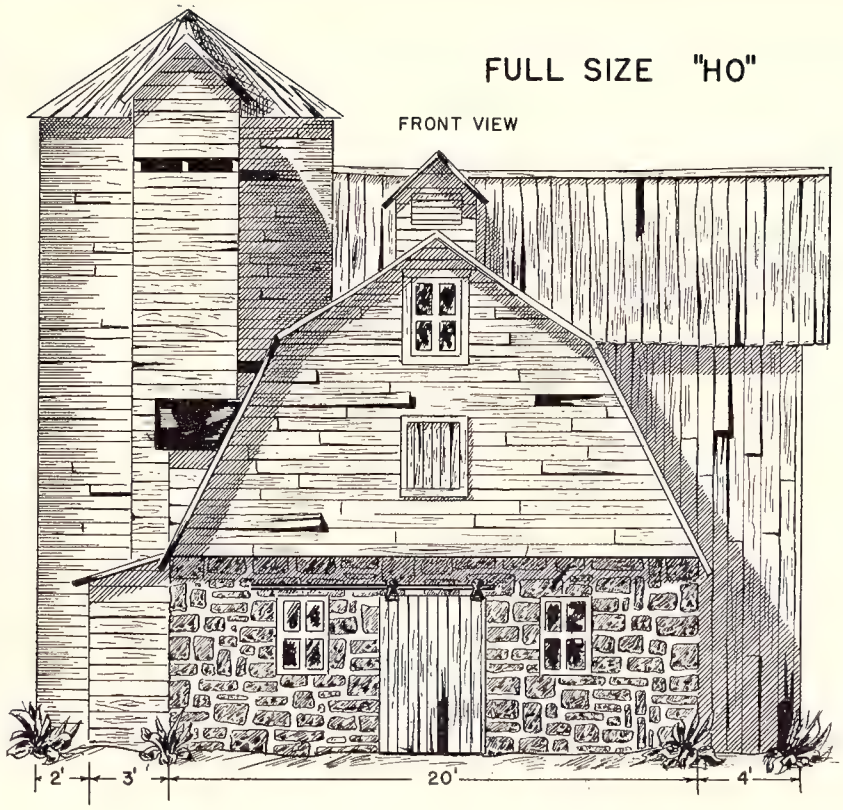






FULL SIZE "HO"

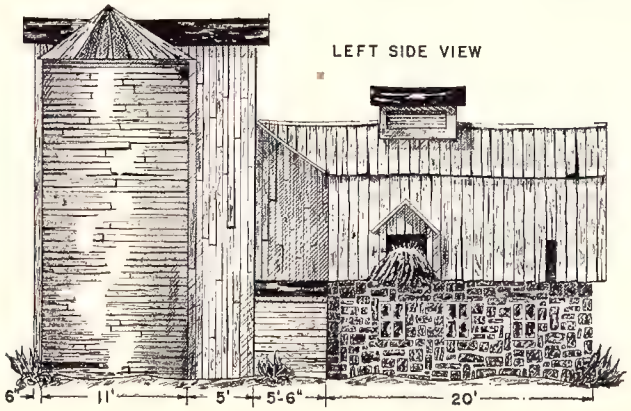
FRONT VIEW



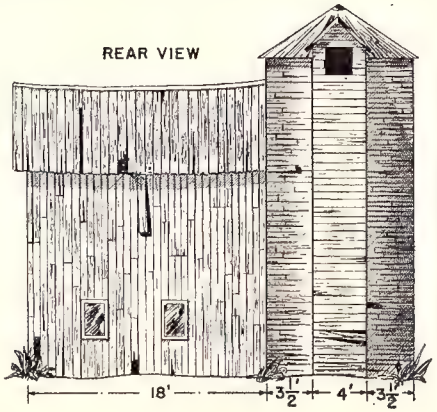
THE BARN

Half Size "HO"

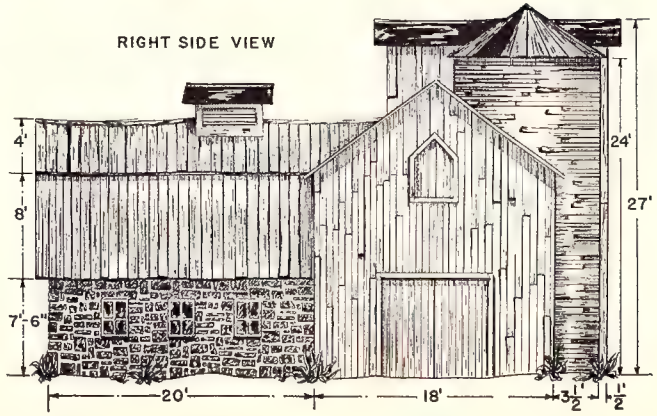
LEFT SIDE VIEW



REAR VIEW



RIGHT SIDE VIEW

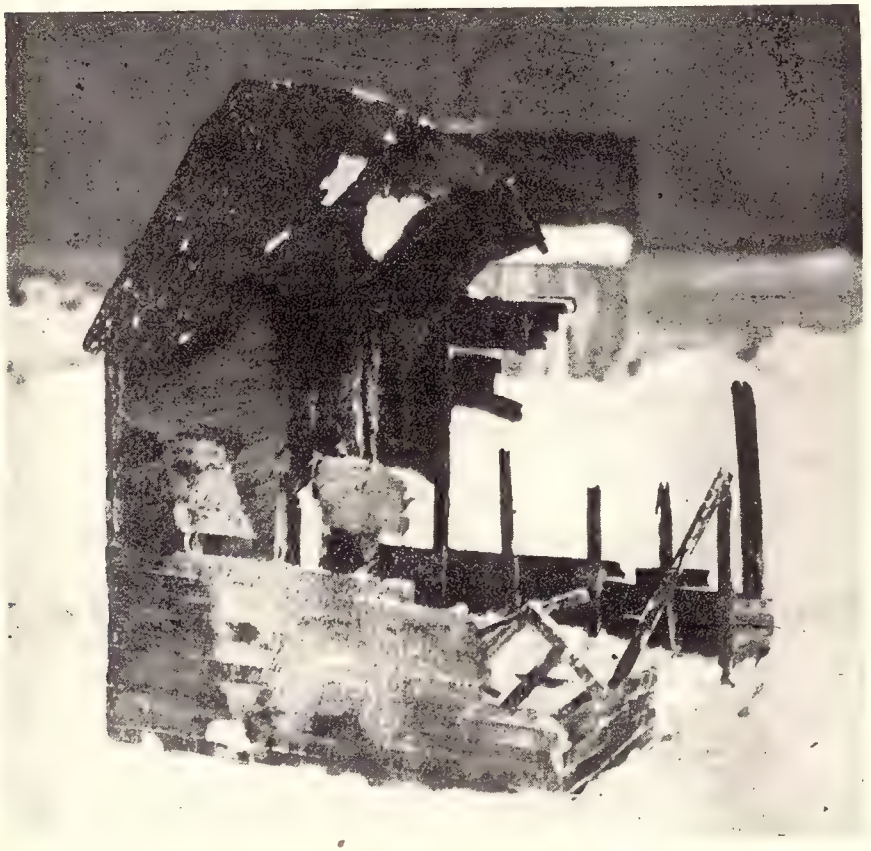


main there a long time, sagging just a little more each year and leaning with the prairie winds.

But let's get around to modeling it. Proceed as usual, by carefully studying the plans and photos. Try and visualize in your mind just how the various parts will fit together. The idea is to make this barn look weather-beaten. The proper kind of paint job will create this effect as will warped roofs, loose boards, and the like. So it would be a good idea to use a comparatively light weight cardboard when laying out the walls. Here is one case where we're *not trying to prevent warping!* Intentional or otherwise, it will only add to the illusion which we are trying to create. Lay out all walls on the cardboard, but do not make the roofing from it. Cut out walls with a sharp blade and you're ready for assembly. Make the silo from mail tubing of proper diameter. Assemble the two main barn units and the silo with its attachments, but do not glue these two units together. The silo will be glued to the main barn unit only when everything has been first painted.

Siding comes next, made by cutting thin strips out of filing cards. In HO, this step may be unnecessary, but does add a wealth of detail. The siding will naturally show up better in O gauge. Cut a whole batch of strips the length of the filing cards. Vary the width of the strips, keeping them somewhere near scale. Look at the plans to see what type siding goes where. Now coat a part of the blank wall with glue and start laying the strips in place. Leave a slight space between each strip and lay some on crooked and some lying over each other. The excess on top and bottom, or sides, can be trimmed off later. In this way, your siding goes on quite rapidly. The siding on the silo is a little too narrow to reproduce in HO gauge, and the fact that it's curved doesn't help any. Here I advise just drawing on the individual boards with india ink and pen, after it has first been painted. Score all siding to represent board joints. Lift up various edges and ends to represent loose boards, using discretion in doing this. The stones in the lower part of the barn are also made from filing card, as well as the window frames, sashes and doors.

Roofing is also made from filing card, first creating the warped effect by fitting a piece of wood in place that will form the properly warped ridge. Glue on a piece of filing card and hold in place until the glue has dried and it has assumed the contour of the ridge piece. Again, it needn't be the exact size as you can trim off the excess. Glue all roof sections in place and trim to size. The roofing on the barn proper is supposed to be wooden planking, so follow the same procedure here as you did with the siding. Thin slivers of wood can be placed on the ridges to cover up any raggy edges. Turn up some "loose boards" on the roof, too.



When roofing the silo unit, it is best to first roof the silo itself. This roof can be easily made by cutting a sector out of a circular piece of card of diameter slightly larger than that of the silo, then add the other roofing. Only the barn and silo roofs are wooden planking, the other roofing representing tar paper. Paint alone will take care of this. Build up the dormer window and ventilating unit and glue in place.

With all doors and windows in, we're all set for the painting job. Use tempera or poster paint, it dries quickly and leaves no gloss. Start with the stonework. First give the entire stone surface a coat of white. When dry, mix a light shade of brown and paint all stones this color. Make this thick enough so that it will not flow into the spaces between stones. You'll have to use care with your brush, not bearing down on it, but rather drag it lightly across the stones. This should leave the paint on the raised portions alone. Now mix a much lighter shade of brown and hit the corners of at least the larger stones. Decide which direction your light is coming from, and mix up a much darker shade of brown, shading the various stones. Shading should be in the corner diagonally from the highlights. Essentially, each stone has three shades of brown now. The coloring may not seem natural at this point because of the abrupt color changes. So take a clean brush, slightly moistened, and blend the colors into each other. Let the shadows and highlights exist however, for effect. If any dry dust is available, rub it into the walls to shade them.

Now for the rest of the barn, starting with the sides. Various shades of gray will be used here and references to them here may seem vague at times, but are used to create a weather beaten appearance through a variety of contrasting grays. First mix a fairly deep shade of gray and apply it to the entire wall surface, making certain that it gets into cracks between boards. Keep paint thin when doing this. Now mix a much lighter shade of gray and apply over the previous coat. Again, keep this coat thin, but try and *prevent* it from going into the cracks. Do not try to make it cover the previous coat completely. Use a deeper shade of gray of thicker consistency and paint the edges of the individual boards, putting some thin streaks of it here and there. Now use india ink and draw in some of the individual siding. Finish up by using a small brush with very little paint on it. Drag some pure black and pure white around the window frames and other high spots. Paint the silo unit also, giving the silo itself a good thick coat of medium gray. Draw in the siding here with india ink and shade it some.

This completes your barn, after celluloid is used behind the window sashes, and perhaps the addition of some hay hanging out the dormer window. Maybe you'll want to do some advertising on the side of your barn, for a bit of extra revenue!

THE MILK HOUSE—This little structure is very simply constructed and matches the house in color. Don't forget the milk cans setting by the door!

SHED AND OUTHOUSE—The shed as well as the outhouse are very easy to build. Just study the plans and follow the general scheme of things outlined in the barn article. The shed however, is supposed to be new, so don't age it too much. The outhouse is the usual ramshackle affair, so anything goes!

THE BURNT SHED—This old shed has been hit by a good fire as well as the weather, and is in very bad shape. In modeling it then, we'll have to duplicate the effects of these two evils. No plans have been given as the photos are suffi-

cient. Make the structure 30′ by 20′ and 20′ high. With the exception of the one wall that remains intact, you proceed to build this shed as you would a life-size building. Build a framework for the three incomplete walls from thin wooden strips. The other wall is simply cut out of cardboard. Glue this one complete wall together with the other three walls. Now, using filing strips, glue the siding to the solid wall as you did on the barn. Use these same strips and glue them to the framework of the other three walls. Leave out boards here and there, and have some protruding from the vertical members. The main idea here is to create a raggy appearance. Glue the four walls onto a floor, and glue on odds and ends to represent burnt timbers that have fallen to the floor.

Now paint the entire interior with a very dark shade of gray. If some of the "boards" warp, all the better. Use a much lighter shade of gray and touch some highlights on the inside of the shed. Treat the exterior as you did the barn siding. Apply the remains of the roof and paint it solid black. This completes the painting.

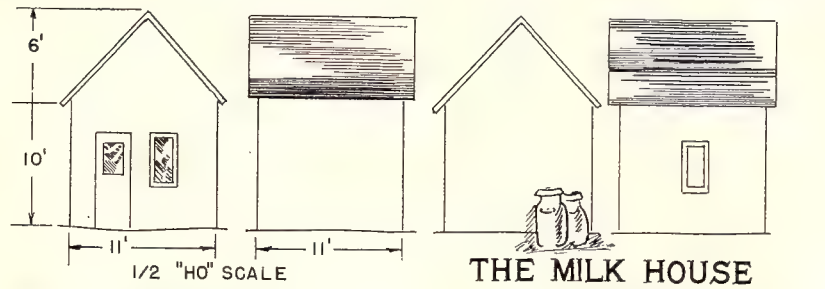
Effects of the fire can be reproduced best by fire itself. Using matches or a cigarette lighter, burn the tips of the protruding vertical members as well as the edges of some of the siding. Also burn the inner edge of the roof until it sags down some, then blow out the flame quickly. Also burn the upper edge of the roof until it burns some. Use both imagination and common sense in doing this work. Remember, the glue you're most likely using is highly inflammable, so be careful! Now smoke the structure with candle smoke, making it heavier in some places than in others. Add other details, such as a puddle of water (clear shellac) and maybe some empty buckets.

THE SCENE—This discussion applies to all gauges. Some of the suggestions may be difficult for the smaller gauges while they are practical for the larger, so use your discretion.

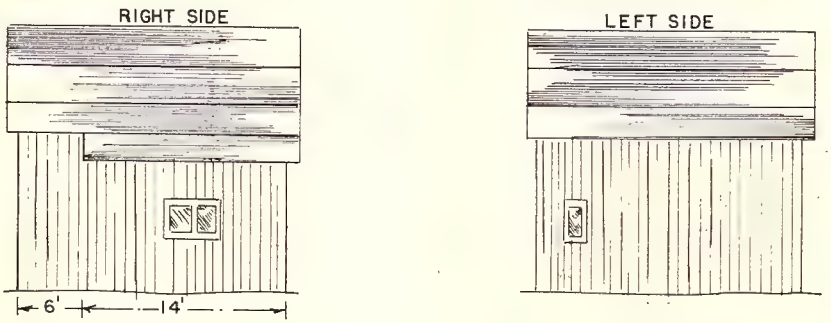
This farm has been built for a winter scene but can be easily changed over to summer, so let's proceed along these lines. First select a suitable spot on your layout for the farm. Group your buildings as desired and glue in place. Landscape the surrounding area, using plaster and the usual materials. Have a gravel road leading from the highway to the barn and shed. The front of the house, at least, is deserving of a good lawn. There are various products on the market now, better than dyed sawdust. Plant shrubbery of Norwegian lichen around the house and corners of shed and barn. Why not a few "stout oaks" around the home?

Fence in a little area by the barn where cows can lounge before their milking time. Include all detail possible, fencing in parts of the cultivated fields and empty pastures. Have some milk cans laying around, old wheels, a ladder, and empty haywagon. There should be an old abandoned Ford around somewhere. Have some people working in your scene—chopping wood, carrying milk or running to the familiar outhouse. Haystacks can be easily made up, and can be covered with a tarpaulin made of thin cloth. A well or pump in back of the house will be appreciated too.

Hop into your jalopy and take a trip to the country. That's the best way to get ideas. Take your time and you'll have an ideal farm. If you're going to have chickens, don't forget to hang out a sign, "Eggs for Sale".

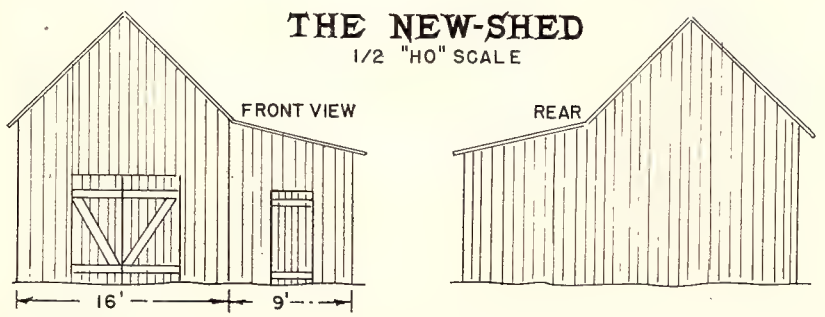


THE MILK HOUSE

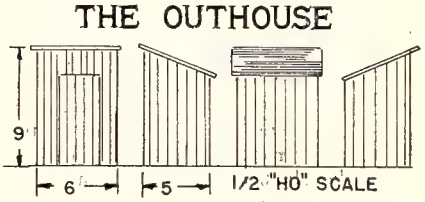


THE NEW-SHED

1/2 "HO" SCALE



THE OUTHOUSE



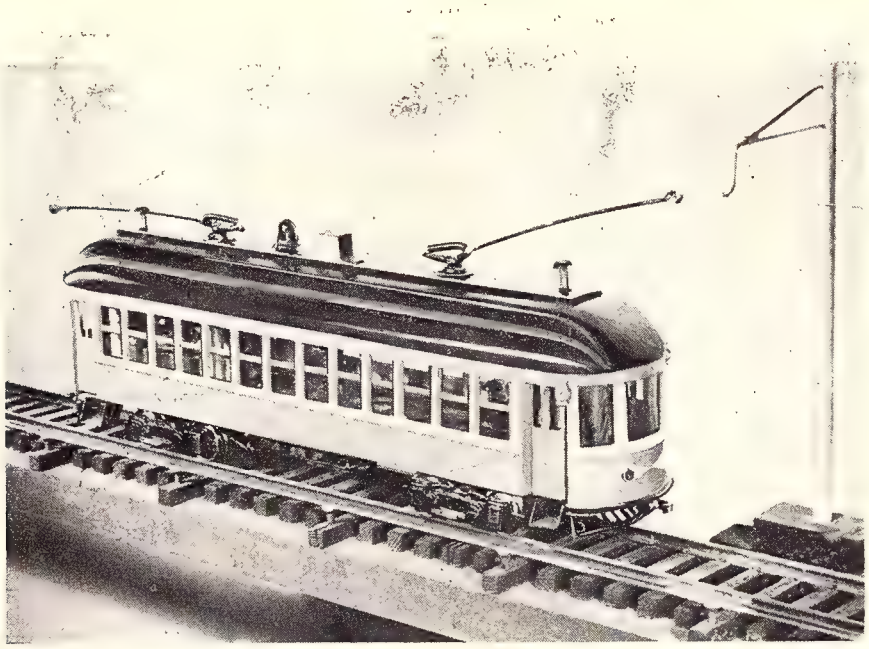


Photo by Haddad

Small Interurban Car

By P. F. ARBOUR

THE car described in this article is an adaptation of a Shore Fast Line Interurban. This line, more correctly known as the Atlantic City and Shore operates between the island resorts of Atlantic City and Ocean City, N. J., by way of the mainland. It is controlled along with the city trolley line in Atlantic City by the Pennsylvania-Reading Seashore Lines, a steam road, which takes care of the freight traffic on the line. Many trolley fans have gotten an odd feeling, seeing a steam switcher tooling a few freight cars down the trolley rails. The line has plenty of passenger traffic, and uses an interesting method of operation during the summer rush periods. Two car trains leave Atlantic City, but after the local passengers have dropped off, the second car is dropped usually at Northfield on the mainland. While the first car proceeds to Ocean City, the dropped car takes a cross-over to the other track where it becomes the first car of a "train" coming in from Ocean City. The line is largely double tracked and employs both overhead trolley and third-rail operation, the latter where it uses the tracks of the old West Jersey Electric (Camden to Atlantic City) across the meadows.

The starting point for any model trolley is the motor truck. These can be purchased quite reasonably or can be made similar to the Long Valley Electric Railway type, previously described on these pages. The truck on this model is built up from a piece of brass channel 1" x 1½" x 1/16" as shown, with a gear on one axle and a piece of tubing set in the top. Slip the worm gear through this tubing, the large bearing of which forms an oversize kingpin, rotating in the tubing. The motor shaft of course, is vertical, and the drive (unless pulleys or chains are added) is on one axle only. This is sufficient if no trailers are to be pulled or steep hills climbed. When the car body is picked up, the drive truck drops off, which is somewhat disconcerting, but not harmful to operation.

Now for the roof and floor. At the present time, it is almost impossible to get commercials, so make your own from *seasoned* wood with a plane and generous usage of sandpaper. Build it up in layers as shown in the sketch.

The sides and ends come next, made up from cardboard, wood or metal, but since previous articles have described the use of both wood and cardboard, let's concentrate on using metal. Sheet brass will work best, although heavy tinplate or flattened tin cans will serve our purpose well. Lay out the sides and ends on your metal, the sides running from bulkhead to bulkhead and not including the vestibule or platforms. If you want the curved tops in the windows, drill a hole and cut out each opening with a jeweler's saw. Keep in mind when using such a saw, that the blade must be set to cut on the *pulling stroke,* which is reverse of the usual procedure. The portion to be cut out is shown in the unfinished central part of the drawing.

The work can be simplified by omitting the curved tops of the windows. The sash are simply cut straight down from the top of the car with a pair of tin-snips and the "windows" either broken or sawed off at the bottom.

In either case, your next step will be to solder the belt rail and letter board in position which come below and above the windows respectively. Next, narrow strips representing the window posts are sweat soldered between windows, allowing an equal amount to protrude on each side forming the sash. A long strip is soldered on the inside of each side to form the meeting rail. Follow this same procedure for the ends, omitting the meeting rails. The bulkheads on this model are solid, but could have a doorway cut in each, with a window on either side. If doors are to be used, they may now be cut out.

Cut a piece of flooring the length of the sides (exclusive of vestibules) and motor mounting arrangements made, depending on the type drive truck used. Sides are now attached to the wooden floor with lills or HO gauge spikes (with heads cut off) pushed through tiny holes in the tin into the wood, and soldered so as to keep the side smooth. An alternative method would be to leave a flange at the bottom of each side to be bent in and under the floor and spiked. The bulkheads are similarly attached to the floor, and to the sides with solder. Platform floors are cut from tin, allowing for the projection of the bumper, and soldered and spiked to the bottom of the bulkheads and floor. Dashers or ends of the car are then curved and soldered to the platform floors. Doors are soldered in between car ends and sides. Lengths of wire are soldered to a length of tinplate, bent to shape and trimmed, then soldered to the platform floor ends for the anti-climb bumpers. Coupler guides of wire, and steps are fabricated and soldered in place on each end.

The car roof is shaped with rasp, razor blade, plane and sandpaper as needed and set on the body. Fit it snugly and add to it such details as the battens at each end (metal or cardboard), roofwalks and pole sockets. These sockets are pieces of tubing to the bottom of which will later be soldered lead wires to the motor. The pole hooks are double so that the pole can be hooked from either side. The bell is a commercial turning with the number sign being formed from either wood or plastic.

The poles are made as indicated on the plans. A piece of brass about 1/8" x 1/4" x 3/4" is drilled for the spring anchorage, the pivot and pole as shown, and filed to shape. The bottom of the pole proper is hammered flat and drilled for the pin and other end of spring. On this model, the spring was obtained from a sewing machine supply house, but could be made up from spring wire or even rubber bands. If more than one spring is desired on each pole, solder cross-pieces through each spring anchorage hole and notch them to take any number of springs up to six. The trolley shoe is a U-shaped piece of tin bent around the end of the pole and filled up with solder, then filed out. A V-shaped notch will follow the wire much better than a U-shape.

Trailing and motor trucks are mounted and then cow-catchers are fabricated from strips of metal or wire and soldered to the steps. The underbody detail is a group of tanks, airbrake apparatus, and resistors, but the most important item is the truss rod on each side. Each of these is formed from wire and soldered to stand-off posts of heavier wire or nails. Try to run your truck rods from truck

center to truck center, rather than as shown in the photo of the model. You may have to chisel them closer to the car floor or even bend them slightly to clear the truck frames on curves, but you will be rewarded with a better looking car.

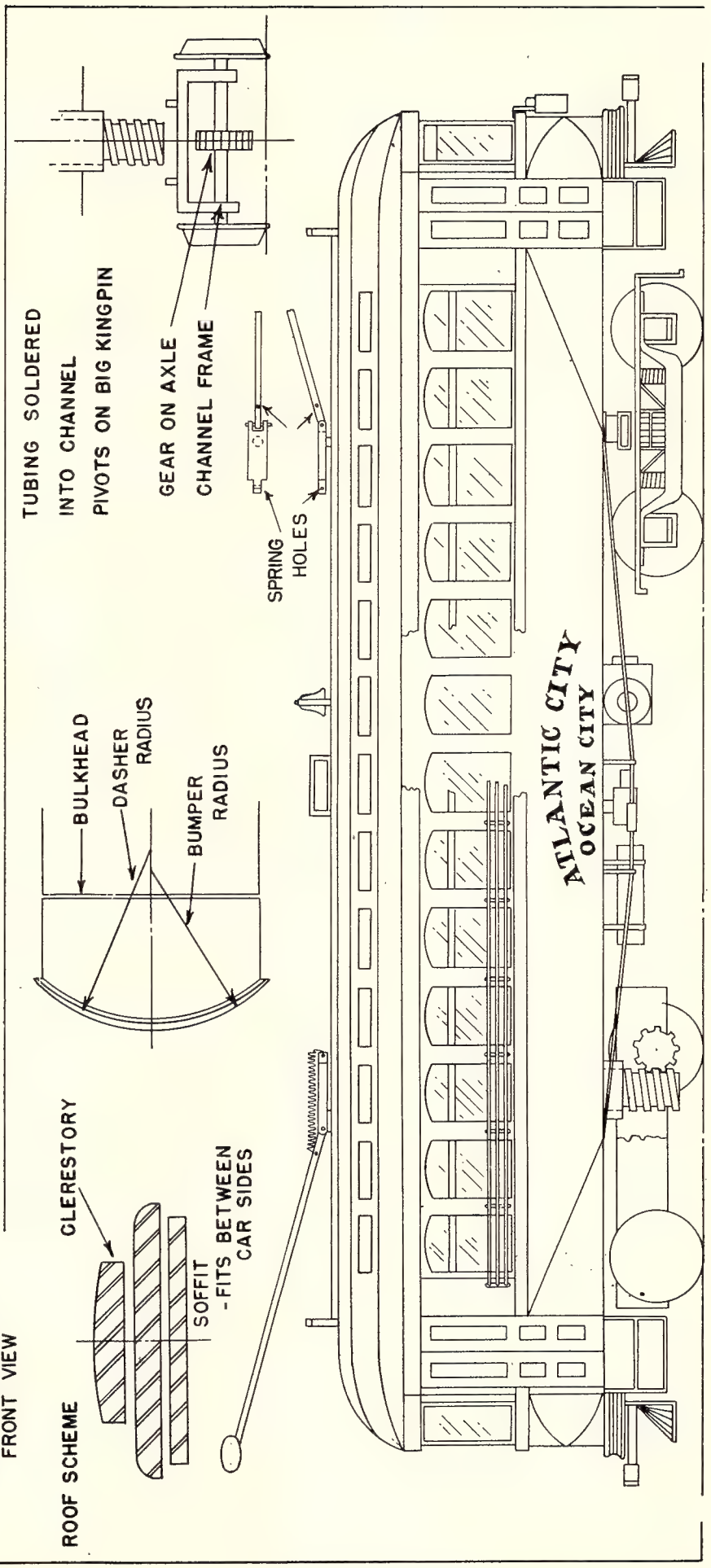
The roof is attached with one or two long bolts run down through the roof and through the car floor, making the car a solid unit. Although the model does not have clerestory windows in the side of the roof, the plan shows them and the addition of these will add much to appearance. Windows are cut from a strip of cardboard and cemented in place on the edge of the deck or clerestory. A post is then cemented between each pair thus creating sash as in the sides of the car.

The paint job, apparent from both photos and plan, is a circus red and yellow. Take particular care to get clean lines between colors; never add the second color until the first is thoroughly dry and make certain you use masking tape during this operation. In the absence of tape, the line may better be marked with a line of black drawing ink. After you have lettered the car, give the model a coat of clear varnish to preserve the finish. Both roof and undercarriage is black.

Wiring the model is fairly simple, with one motor lead running to both trucks while the other lead runs to both poles and to third rail shoes, if used.

Trolley retrievers are formed from short lengths of brass rod. The demountable headlight is made up from a piece of brass at least one scale foot thick. A drill is started into this to make the reflector, the piece then being filed down to the shape as shown. One or two straps are bent to shape and soldered to the back. These can hook onto special headlight brackets at each end, but will be just as convenient to hook them over the edge of the sash between the "glass" and dasher.

When the painting is completed, all glass is added. This has been delayed in order to avoid the earmark of many models—paint on the glass! Side windows are made from actual window glass cut to size, adding greatly to the weight and rigidity of the model. It is kept in place with a snug-fitting extra floor tacked above the regular floor, and by a wood spacer next to each bulkhead. The curved end windows and the glass in all doors is made from celluloid cemented in position.



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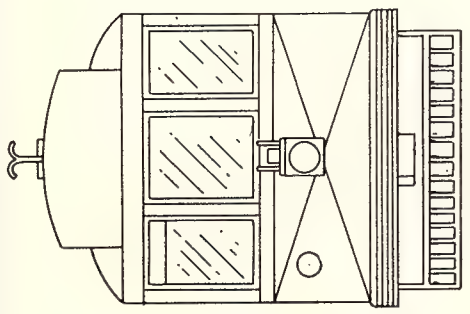

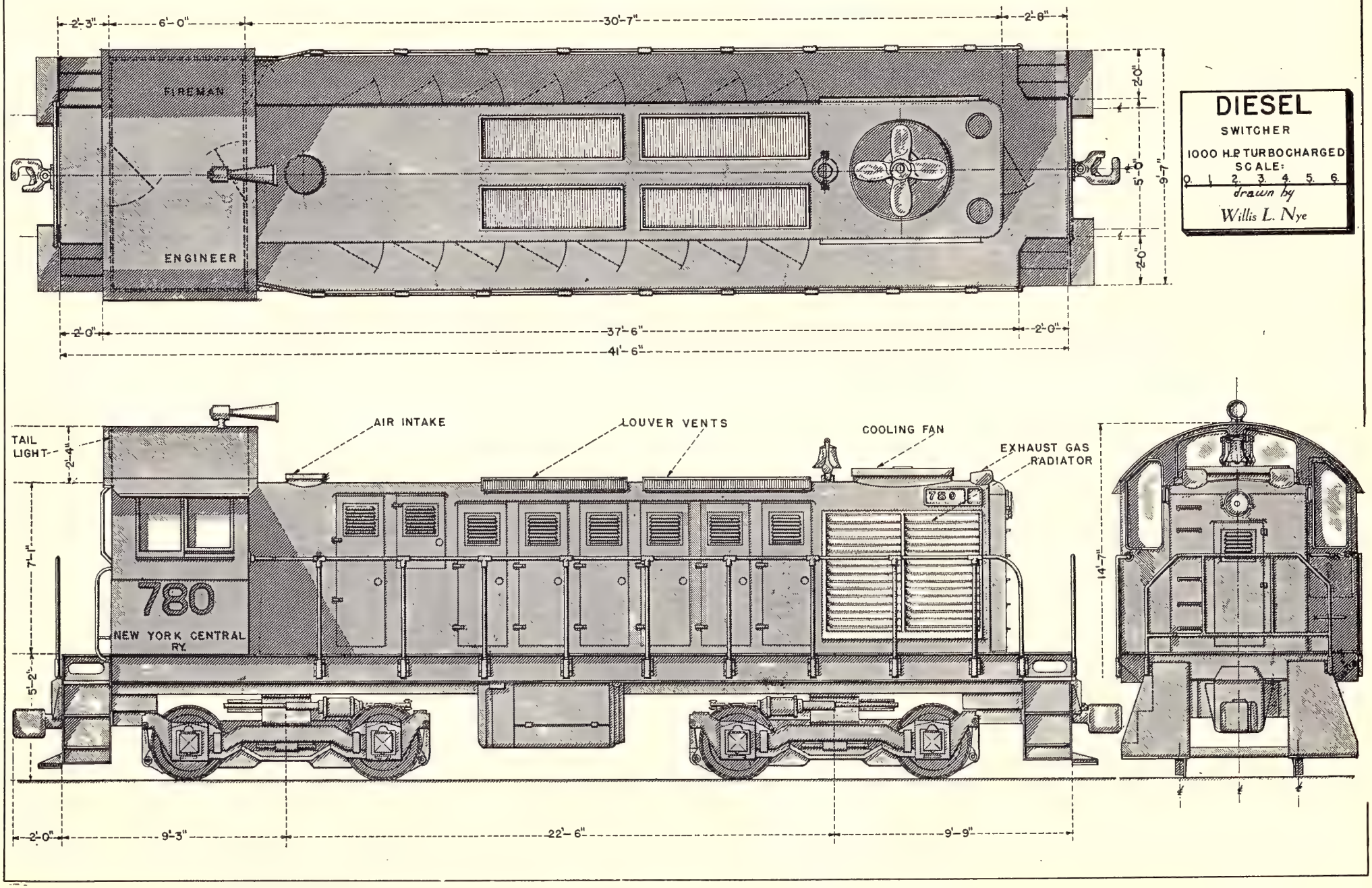
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2'-0"
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22'-6"
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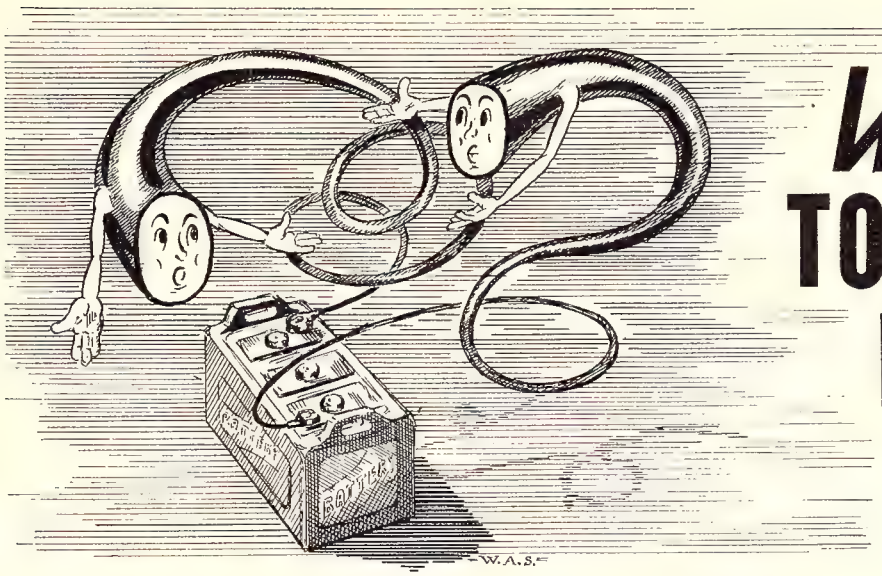


WHERE TO PUT YOUR FEEDERS

Learn how to connect feeders on both straight and circular layouts, with practical examples showing how to compute Voltage Drop in Feeders

IT MAKES little difference where the feed wires supplying power to the track are connected on small layouts such as Junior's tinplate outfit, but on larger pikes with longer tracks it does make a "whale of a difference"! In Fig. 1-A, the common method of connecting the feed wires (or feeders) to one end of the rail is shown. When rails are ten to twenty feet in length and more than one engine is to be operated over this section at the same time, the voltage drop caused by the electrical resistance of the rails can be reduced one-half by connecting feeders at the center as shown in B. Here it becomes evident that no matter where the locomotive is located on this track section, the length of rail can only be one-half of that in Fig. 1-A. For example, if the track is ten feet long, then with the locomotive at the far end of the section (Fig. 1-A), there will be twenty feet of track through which current must pass. Fig. 1-B shows that the longest length of rail encountered will be ten feet (two lengths of five feet each).

This same rule holds true for circular tracks as shown in Fig. C. & D. If the circumference of the circle is twenty feet, in Fig. C the maximum length of rail encountered with the engine at a point opposite the feeder connection will be twenty feet. In Fig. 1-D, this length of rail (resistance) will be only one-half as great, or ten feet.

On still longer track sections, it is necessary to connect feeders at frequent intervals along the rails to reduce voltage drop, as Figs. 2 & 4 clearly show. With the use of two voltmeters, you may measure the drop in voltage in this track and feeders by connecting one meter across the power-supply and the other across the rails (Fig. 2). All voltage measurements must be made under load; that is, with the motor (locomotive) drawing its normal current. Voltage readings taken when the normal load current is not being drawn from the line will only prove misleading, since fall in potential is caused by the passage of an appreciable current.

CALCULATING "VOLTAGE DROP"

NMRA suggests twelve volts be used at the source of supply and that motors be wound for eleven volts, thus allowing for maximum voltage drop of one volt between source of current (i. e. battery) and the motor terminals. It is wise to keep this voltage drop below this value, and the drop in the feeders down to approximately one-half volt or less.

Suppose we have a case where 12 volts D. C. is available at the power supply and we are to allow a drop of 0.36 volts in the feeders (this is 3% drop following average electric light circuit practice). We can determine the electrical resistance of the feeders for this voltage drop and a current of five amperes (assumed) from Ohms law: *R equals E/I* where R is resistance in ohms, E the voltage drop, and I the current in amperes. Substituting the values in our case, we have:

$$R = .36/5 \text{ or } .072 \text{ ohms}$$

This is the resistance for both lengths (total length of wire) in the feeders between battery and track. No. 14 B&S copper wire has a resistance of .0025 ohms per foot and .072 divided by .0025 is 29 (ft.), the length of feeder wire (total) permissible for the .36 volt drop.

By using the other forms of Ohms law, E = R times I and I = E/R, we can compute or check the various factors involved.

In the above example, E = R times I (.072 times 5 or .36 Volts); likewise I = E/R or .36 divided by .072 equals 5 (amps.).

DETERMINE WIRE SIZE

To use the accompanying table, multiply the length of the circuit in feet by the amperes (maximum) load to be carried, look for the nearest Amp.-Ft. equivalent in the table and the size of wire will be found in the column at the left, the "voltage drop" appearing at the top of the table.

Example: Suppose the length of the circuit (one way) is 28.5 ft., and that 5 amps. is the maximum current; then 5 x 28.5 equals 142.5 (Amp. Ft.). If you only have No. 14 wire at hand, reference to the table shows that 142 Amp. Ft. occurs in the .72 volt drop column (equivalent to a 6% loss on 12 volt supply voltage).

If you wanted a smaller voltage drop, for example, .48 (4% loss) then the nearest to 142 Amp. Ft. is 151 in the second column; this calls for No. 12 wire. Voltage drop or the size of wire may be ascertained from this table as shown.

Calculations are given for direct current. Alternating current will affect the values somewhat, but as long as the feeders are straight wires, with no coiled sections, the formulas given will provide close enough results. A.C. instruments would be needed of course to take current and voltage measurements in A.C. supply circuits.

In actual practice, electrical resistance of the rails would have to be considered in making an accurate calculation of total voltage drop between battery and motor terminals. Another source of voltage drop is that across the contact between rail and wheel (dirty rails may easily run this voltage drop up considerably); another source is that across the small wire connections and joints inside the locomotive.

Considering all this, you can see the importance of keeping the voltage drop in feeders down to as low a value as possible, compensating for additional

Table based on 12 volt DC supply

B & S Ga. Wire Size	Percent	3	4	5	6	8.3
	Volts Drop	.36	.48	.60	.72	1.0
14	Amp. Feet	72	95	120	142	198
12		113	151	189	227	316
10		182	242	303	363	505
8		285	382	478	573	795

losses in wheel contacts and internal engine connections, etc.

A temporary "load" such as lamps, etc., may be used to set up the circuit for test. If the voltage drop in just one feeder (A) in Fig. 5 is measured and the length of the other feeder (B) is exactly the same, then the total voltage drop is twice that measured. (The total length of wire in the feeders may be temporarily hooked up for test, keeping the normal load current passing through the feeders while taking voltage measurement.) A high resistance voltmeter should be employed for tests in all cases; cheap meters have a low resistance and results obtained will be misleading, as an additional voltage drop may be caused by the current drawn by the meter.

Another method of measuring voltage drop in feeders (or other parts of the circuit) is to bridge the specific section of feeder or track, etc., with a voltmeter as shown in Fig. 5.

Naturally, the current passing through the circuit under test must be known; the simplest way to determine this factor is to connect an ammeter in series with the feeder (or other circuit under test). In the case of our calculated example, voltage drop might be measured by stretching out the 29 feet of #14 wire and checking to see that the computed current of 5 amperes was passing. A temporary load such as lamps, may be used to set up the circuit for this test. If the voltage drop in one feeder (A) is measured, then the total drop is twice that measured.

From Ohm's law, E = R x I, we can see that if the resistance or the circuit is increased, we shall have a corresponding and proportional increase in voltage drop. Likewise it can be seen that decreasing resistance reduces voltage drop.

Fig. 3 shows how a feeder may be tapped at intervals onto the rails of a large circular layout. It is interesting to note that the NMRA recommends in the case of trolley layouts that feeder connections to contact wire should be spaced not over 500 scale feet, and to rails not over 1000 scale feet.

Fig. 4 shows how multiple feeder connections are made to four sections or blocks of track; short sections of track may be satisfactorily fed at the center while the longer sections should be fed at two or more intervals. A few voltage measurements made with the engines operating on the system will show where further additional taps to the feeders are required.

Don't make the mistake of checking the voltage drop with only one or two engines operating and afterward start up half a dozen others . . . and then wonder why the voltage drops 20 or 30 per cent. For average small layouts, No. 12 or 14 wire will usually carry the load, without too great a voltage drop. On larger systems, like those used by railroad clubs, the feeders may have to be as large as No. 8 or 10 B&S gauge. On the Channel Club Layout of Santa Barbara, California, large size feeders are used. As pointed out in a letter received from Leon Bartholomew of this club . . . "We have #8 wires running clear around the entire layout to supply all control boards. The common ground wire which is bonded to one rail of the system is #6 part of the way and #4 over most of the distance. (*This is a very large layout. . . Ed.*) The Mountain Division has its own ground wire, independent of the main line trackage, but it is connected electrically to it at the battery, so that in effect there are two #6 and two #4 wires in parallel (in spots) which serve as the ground. The main board feeds each block (of the thirty blocks) through #10 wire, for runs up to ninety feet; #12 wire for runs up to 75 feet, and #14 wire for short runs. Each block has its own feeder wire.

"We have pulled three heavy Mallets, each with a No. 4 K&D motor, in a triple-header (with everything but the kitchen sink tied on behind) over our 2% mountain division grade, with no trouble at all. Our worst voltage drop is caused by "dirty rails," as we do a great deal of operating this does not happen often, but when it does the boys have to get busy with elbow grease and sandpaper and clean them off.

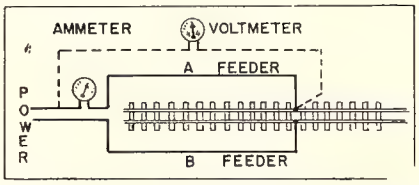


Fig. 5—Total feeder "drop" is twice that measured in A, if length of B is same as that of A.

"Some operators use small size wire and try to compensate by using high voltage input to overcome the resistance. This will not provide smooth operation . . . another mistake lies in making the rail do all the work of carrying the current. The right method is to carry a good size feeder wire along under the track and tap it to the rail at each rail length, with No. 18 stranded or solid wire soldered firmly in place."

FIG 1.

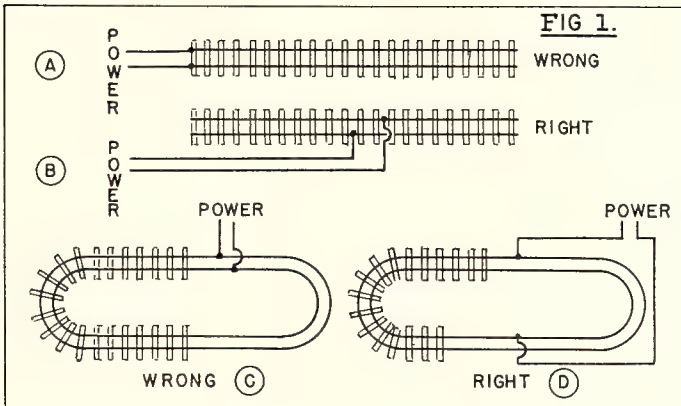
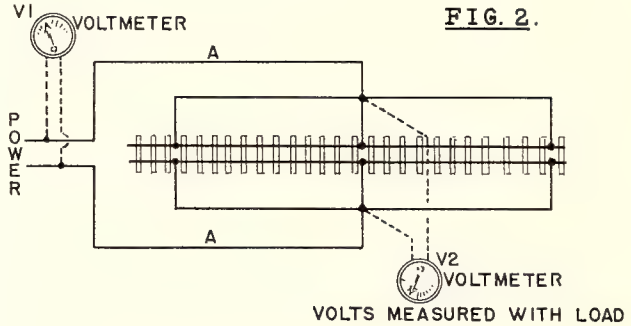


FIG. 2.



VOLTAGE DROP IN FEEDERS AA = VI − V2

FIG. 3.

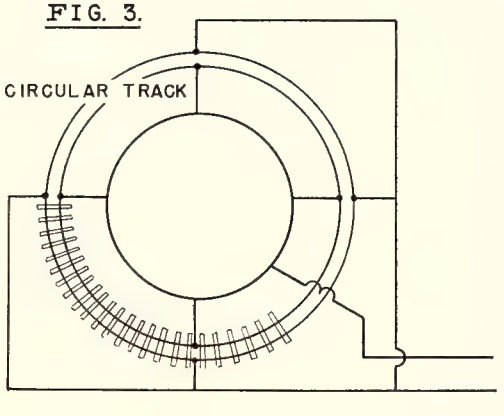
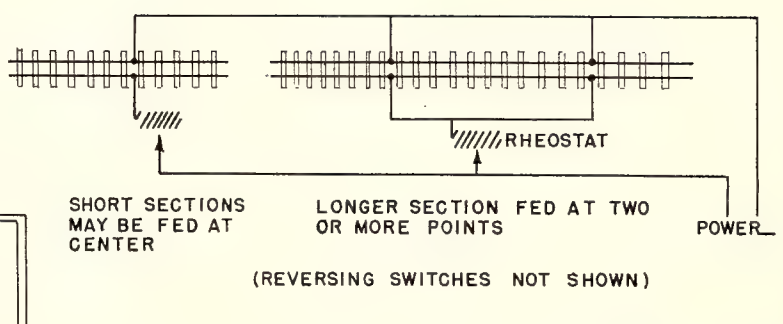


FIG. 4.



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BIG COLUMBUS DAY MEET HELD AT FRISCO

COLUMBUS really landed at San Francisco's Perfect Circle Speedway on Oct. 13th. Of course, he arrived on Oct. 12th as per schedule, but the Club didn't expect such a large turnout of his followers on Saturday so only had a formal reception in honor of the "Old Boy" on Sunday, Oct. 13th. In honor of Chris "C" as the holder of the first world's record (new and old) for trans-Atlantic crossings, the S. F. M. M. A. held one of the best attended meets of its entire career to date. Some 75 entries were taken, representing model race car fans from over 500 miles away as well as a record attendance of the local boys in the Bay area.

The Weather Bureau gang had quite a time keeping the fog from getting too thick but with the help of "Old Sol" they finally managed a very fair day for the big event.

Cars were run for ¼ mile heats and while no new records were set, there were some times that were in hundredths of the record times. Top speed in three classes went to Charlie Lamb of the Lamb-McCoy Team in the Spur Gear Class at 116.12 MPH; to Wilmer White in the Special Proto Class at 109.35 MPH; to "Willie" Wilson in the Mfg. Proto Class at 100.22 MPH. In the Special Proto Class, there was a dead heat between Wilmer and the Lee-Snow proxy run by "Woody" Woodward at 109.35 MPH, with the run-off giving White the edge.

The new "Hot Rod" or Roadster was very much in evidence and lacking any satisfactory method of allowances and specification to establish a class, these cars were run in the Spur Class due to the type drive employed. In the near future however, a specific class will be established for these new-comers so competition will be on a more even basis. How about an AMRCA ruling to cover this new Class as well as the Manufactured Proto Class? Incidentally, the Manufactured Proto Class as inaugurated by the S. F. Club is really booming. The fellows seem to be all for it and there has already been some keen competition between Doolings, Papina's P-3, Duromatic's Invader and the Pacemaker. Results follow.

SPUR GEAR	MPH
Charlie Lamb	116.12
Wilmer White	113.92
Dick McCoy	112.21
Art Silva	111.66
S. Stewart	109.62
R. Kareflos	107.27
J. Russell	107.01
Cece Bonnett	106.50

SPECIAL PROTO	
Wilmer White	109.35
Lee-Snow (proxy)	109.35
Charlie Lamb	107.14
Dick McCoy	105.63
"Woody" Woodward	105.26
George Hook	98.68
R. Francis	98.36
L. Shearer	98.14

MFG. PROTO	
D. Wilson	100.22
S. McCormick	98.57
D. Bozarth	96.56
Andy Anderson	96.46
Dick Milburn	95.33
W. Allsman	93.07
Jim Papina	92.97
D. Lutz	90.72

MINIATURE RACING CARS

FIRST ANNUAL NEW YEAR'S SPEEDWAY CLASSIC SCHEDULE

COMPLETE information has just been received regarding the First Annual New Year's Championship Race being held at Monroe, La., on January 1, 1947. Tracks will be open all day to contestants for practice runs on December 29, 30, 31. No practice runs permitted on January 1st.

There will be ¼ mile, ½ mile and 1 mile events, starting promptly at 10:00 A.M. Schedule or manner of racing may be changed at any time if deemed necessary by the Race Committee. Racing will continue until 12:30 P.M. A *free* Southern Style Barbecue lunch will be served during the one-hour rest period from 12:30 to 1:30 P.M. Running will begin at 1:30 P.M. and continue until all events have been completed. If time permits, there will be two heats for both the ¼ mile and ½ mile events, with only one for the full mile. Entry fee is $3.00 per car and this includes all events. Sufficient work benches and pit space will be provided.

The seventy foot diameter concrete running surface track is located on the grounds of the Lakeside Country Club, three miles north of the city. The track is new! No expenses have been spared to make it the most level track in the entire country! It's a real *fast* track! Spectators are protected with a five foot cyclone fence and contestants with a 1½ foot crash wall and a three foot cyclone fence. Only two classes of cars will be recognized, Spur Gear and Protos.

All contestants must be AMRCA members and races will be run in accordance with AMRCA Regulations.

All Proxy cars are invited and should be sent to Fran Brennan, c/o Brennan Utilities, 515 Ouachita Ave., Monroe, La., together with full instructions. Special care will be given all cars so top performance may be obtained. All proxy cars will be run consecutively as a group and operated by a special committee appointed by the Race Chairman. Cars will *definitely not be altered* in any respect unless specific instructions accompany car.

Of the many trophies and prizes to be awarded, there are two outstanding beautiful grand trophies that will be given the contestant who breaks the now existing speed record both in the Spur Gear and Conventional Class. There must be five cars entered to make a class. If the record is not broken in Monroe, these trophies will be still on the block and will be awarded to any contestant throughout the country that does break the record. Both trophies however, will be awarded only when the record is broken in a sanctioned race.

All hotel reservations must be made early, no later than Dec. 28th. No guarantee can be made for rooms after this date. Write, wire, or phone, but get them in! Address all communications to Fran Brennan at the above address.

P. S. *There's good fishing for your wife and family adjoining the track. Bring your own tackle!*

"JUNKY" ANDERSON MEET STAGED AT ONTARIO

By LLOYD BAAB

THE Valley Model Race Car Association staged their "Junky" Anderson Race on October 19th & 20th in recognition of Andy who is a comparative newcomer in race cars, but has proven beyond a doubt that he is one of the most popular model car drivers. Andy acquired the name of "Junky" not by handling junk but by having a tool box filled at all times with new spare parts for any of the most popular race car motors. If memory serves me right, a culprit by the name of Ray Hook tacked the moniker of "Junky" on Andy Anderson. One must attend a race car meet to enjoy the antics of Ray Hook and Andy. Just to give you an idea as to how these two hilarious fellows cavort and perform during a race, they are constantly planning tricks on each other by setting newspapers on fire at each other's *differentials* thus creating moans and groans that would put wrestlers to shame.

During this last meet, Andy thought that newspapers were too tame, so he asked the aid of several fellows to hold Ray aloft while he held a lighted blowtorch under him. This act really kept the racers and contestants in constant laughter. We are looking forward to what will happen between these two at the Modesto Race coming up on Nov. 9th. It should be good!

Now for the highlights of the meet. The slowest time, but by the finest and most congenial fellow, was turned in by Curly "Rubber" Glover in the Proto Class at 75.63 MPH. Dick McCoy, in the Non-competitive Class, turned in 113.49 MPH with his spur gear car. In the Non-competitive Proto Class, McCoy registered a neat 102.38 MPH and Charles Lamb posted a 101.92 MPH, both cars of the Lamb-McCoy design. Emil Yost, Sr., won his first trophy at this meet along with Capt. Alexander and Mr. Graves. Many new faces signed up for the meet and there is no telling what the future will bring with new entries. One important item noted by the writer in the last few meets, is that something must be done to speed up race car meets so that every contestant will get in all the runs to which he is entitled. Most delays are attributed to two things. First, the clubs will not start on time as planned, and second, valuable time is lost by not getting another car ready when the cable attendant is waiting. There is no doubt that the time limit will have to be cut in the future in getting a car started and on its way for an official time.

Photo by Baab

"Junky" Anderson Race, Ontario, Calif. Left: "Junky" presenting to Chas. "Smoky" Lamb the trophy for first place in Spur Gear.

This meet was IMRCA sanctioned and conducted under these rules that a car must weigh a minimum of six pounds The race drew over 70 cars. A new idea was tried to enable newcomers to win a trophy and the plan worked very well. A certain percentage of the cars were put into "A" and "B" classes at the time of trial runs, putting competition on a

(Continued on page 42)

Photo by Baab

Group scene at the Junky Anderson Race at Ontario, Calif., Oct. 19th & 20th.

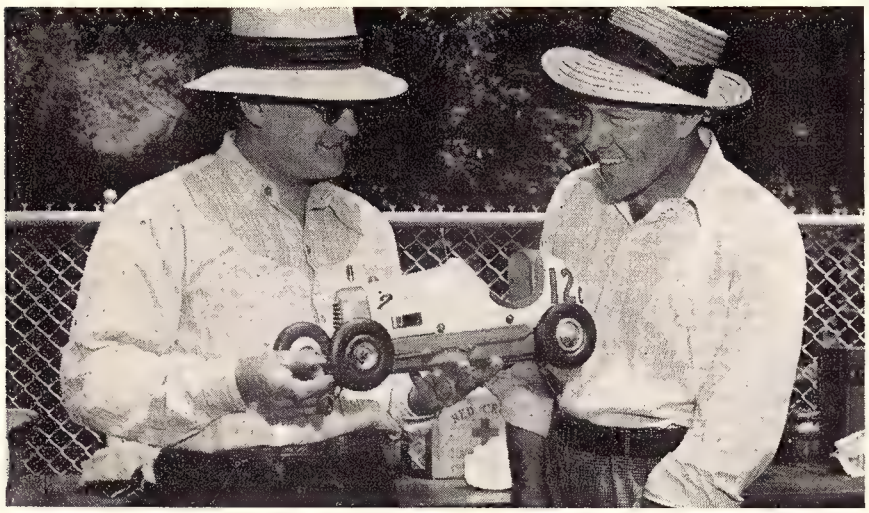


Photo by Hitze

Hap Wykoff (right) and Jimmie Thompson discuss the merits of rail racing versus cable.

CHICAGO-MIDWEST WINDS UP 1946 SEASON

By J. T. THOMPSON

THE Chicago boys finished up their 1946 weekly racing schedule on Sunday, Oct. 27th, with a fine crowd of spectators. Their schedule starts on the first Sunday in May, ending with the last Sunday in October, making six full months of racing. The season just finished, although short, having been started July 26th with the completion of the new track, was still very successful. There was not a single "rain-out" and good crowds of spectators attended each show. The net financial gain was 68.5% of the cost of the track, thus making it quite safe to state that a track can be made to pay for itself in one season. The boys can now retreat to their workshops with a lot of satisfaction in knowing that next season they can reap some reward for their time and effort, and the new ideas they expect to put into their creations during the long winter evenings and Sundays.

Many problems of the past several years have been dissolved by the "back to normal" swing of the country. Such items as engines, tires, etc., which formerly occupied the thoughts of the boys can now be forgotten, leaving the road open for much thought on new designs. The stocks of the hobby dealers are growing, day by day, making it no longer necessary to build new engines, or wonder *"what are we going to do for tires?"*, or *can we build a mold, and where can we get some tires made"?* As a matter of fact, this change is already very noticeable in the lack of anxiety exhibited by the boys at club meetings. Formerly, a hot discussion could be started at the drop of a hat, but recently the air of satisfaction and relaxation prevails, and it is next to impossible to start an argument.

Proof of progress lies in the fact that several of the boys, who never ran too fast before, have been making their bid for top row recently. A glance at the qualifying times will identify them. A good example is the case of Harry Vernon. Harry has worked very hard for several years, but only during the last of the season, did he get his car up among the top four who run in the feature race. For example, Oct. 6th he qualified at 75.38 MPH and finished third in the feature. Oct. 13th, tough luck caught up with him, but on Oct. 20th he came back qualifying in top place at 77.86 MPH, finishing second in the feature, with the unbeatable Willie Weller running first. He then came back on the last day, Oct. 27th, with another 77.86 MPH (very consistent) and took another second place in the feature.

George Riff has been consistently taking first place in the Conventional Class, which is something new for him. Eddie Marks has been showing considerable speed with his streamliner, and so we are seeing some new names listed at the top with some of the old timers taking somewhat of a licking.

Jimmie Thompson came down with a case of "Midget Fever" and was absent during October, while getting acquainted with his new White and Red Midget #12. P.S. *We wives of these Model and Midget builders will probably have to start our own club. What with every spare moment in the basement or garage, working on either model or midget, we can hope only to see our husbands at meal time. Occasionally they will permit themselves to be dragged out socially, but we know their minds and spirits are left at home.—Mrs. Jimmie.*

STREAMLINE CLASS
FINAL POINT STANDINGS
(Aug., Sept., Oct. 1946)

Name	Car. No.	Points
W. Weller	4	1615
C. Rohrer	1	1400
J. Thompson	12B	930
B. Meskowski	5	805
H. Vernon	7	655
J. Loschaivo	6	410
H. Kopack	9	395
F. Pawlikowski	3	340
C. Widen	11	310
E. Marks	33	170
H. Vernon	7A	100
E. Lipski	2	75
B. Buratto	22	70
A. Greenwood	32	25
C. Wolff	21	25
E. Lipski	2A	10

CONVENTIONAL CLASS
FINAL POINT STANDINGS
(Aug., Sept., Oct. 1946)

Name	Car. No.	Points
C. Rohrer	1A	1290
G. Riff	26	1260
J. Thompson	12C	945
Roy Springfield	15	785
B. Meskowski	5A	555
J. Loschaivo	6A	410
H. Vernon	7A	395
R. Staschke	10	385
A. Greenwood	13	260
J. Rozhon	34	225
T. Alongi	8	195
G. Fetzner	30	185
Ray Springfield	57	85
G. Schaap	27	75
F. Tregler	52	25

RESULTS OF ONE MILE FINAL
RACE FOR OCTOBER
CONVENTIONAL (Oct. 6th)

Name	Qualifying Time	MPH
1. G. Riff	12.35	72.88
2. C. Rohrer	12.34	72.93
3. J. Thompson	12.74	70.65
4. A. Greenwood	13.32	67.57

CONVENTIONAL (Oct. 13th)

1. J. Loschaivo	12.28	73.29
2. H. Vernon	12.45	72.29
3. A. Greenwood	12.55	71.72
4. C. Rohrer	12.28	73.29

Carl (Mother) Widen of Chicago, with his #44 Streamliner.

CONVENTIONAL (Oct. 20th)

1. G. Riff	13.47	66.82
2. B. Meskowski	12.56	71.66
3. J. Loschaivo	12.21	73.77
4. A. Greenwood	12.78	70.42

CONVENTIONAL (Oct. 27th)

1. G. Riff	12.12	74.26
2. H. Vernon	13.10	68.70
3. Roy Springfield	12.65	71.15
4. E. Wheeler (South Bend, Guest)	13.84	65.03

STREAMLINE (Oct. 6th)

1. C. Rohrer	12.00	75.00
2. W. Weller	11.77	76.47
3. H. Vernon	11.94	75.38
4. E. Marks	12.39	72.64

STREAMLINE (Oct. 13th)

1. W. Weller	11.58	77.72
2. C. Rohrer	11.55	77.92
3. J. Loschaivo	12.08	74.50
4. E. Marks	13.30	67.52

STREAMLINE (Oct. 20th)

1. W. Weller	11.72	76.79
2. H. Vernon	11.56	77.86
3. C. Rohrer	11.65	77.26
4. J. Loschaivo	12.40	72.58

STREAMLINE (Oct. 27th)

1. W. Weller	11.76	76.53
2. H. Vernon	11.56	77.86
3. B. Meskowski	12.15	74.08
4. F. Pawlikowski	12.33	72.99

SUSQUEHANNA CLUB VISITS AUBURN GANG

SEVERAL of the boys in the Susquehanna Club traveled to Auburn, N. Y., to take in their meet held Oct. 13th. High speed for the day was turned in by Ralph Hendrickson of the Susquehanna Club at 83 MPH. This figure looks extremely low, but when we take into consideration that Ralph's spur was in the air as high as *two feet* during the run you can readily understand the low speed! Incidentally, Ralph took fifth place at the Long Island track June 23rd with a speed of 107 MPH!

The race was hotly contested with the protos, between Dick Bell and Dave Reed, with Dick getting the edge in the final heat.

The Auburn boys have a fine setup for a track, with a strong five foot fence for spectators. The track surface is the downfall of the track, being made of asphalt and not very smooth. It is hoped that the Auburn boys will be able to sport a new track surface next year, for there are at least five fellows who are willing to drive up there next year and run with them!

Many fine prizes were awarded with a complete set of wheels and tires for the new Dooling going to R. Hendrickson for high speed. Other contestants received prizes such as spark plugs, coils, motor oil, etc. The Auburn Spark Plug Co. was kind enough to donate a complete set of their plugs to fit the winner's large car.

The entire Susquehanna Gang take this opportunity to extend Holiday Greetings to all you model race car fans! . . . *Dave Reed, Jr.*

Meet some of the boys of the Susquehanna Valley Model Race Car Club and the Auburn Modelers Association. First five in from the left are the Auburn gang.

FIRST INTERSTATE CHAMPIONSHIP MEET FOR DENVER

DENVER Miniature Race Car Association held their first post-war Interstate Championship Meet on Sunday, Oct. 6th and Sunday, Oct. 13th. The meet was scheduled for the 6th, but due to weather conditions, the Officials decided that if the weather cleared at all they would permit the out-of-town cars to complete their times. About noon, the skies cleared and the boys got busy drying the track and got under way. Six cars were entered from Salina, Kansas, and nine cars from Pueblo, Colo., and it took the balance of the afternoon to get their times.

The boys had a total of 48 entries, leaving 33 cars to be run the following Sunday. They were fortunate on that day, having perfect racing weather, with the meet starting at 9:00 A. M. and finishing at 5:00 P. M. Entries competed in four classes: Plain Bevel, Ball Bevel, Front Spur and Rear Spur. National point scoring system was used to determine the final position of each entry, and the race was run under National rules.

PLAIN BEVEL

Name	Best ¼ mile	Best 1 mile
Worthen	13:84	55:19
Van Duyn	13:95	55:43
Skinner	16:31	64:93
Lewis (Pueblo)	17:99	69:86
Salmon	18:36	76:01

BALL BEVEL

Norberg	10:91	44:10
Fitting	11:15	44:19
Warkins	11:01	44:45
Guldman	11:20	44:52
Brooke (Salina)	12:04	44:28
Zeigler	11:40	45:22
Stewart	11:76	46:08

FRONT SPUR

	Best ½ mile	Best 1 mile
Steinberg	18:52	36:81
Pusch	18:82	38:38
Rees	19:03	38:44
Swain	19:24	38:53
Vernon (Salina)	19:47	38:70
Goedde (Salina)	20:10	39:62
Kelly	20:58	39:88
Beck	20:47	42:55

REAR SPUR

Skinner	22:85	45:30
Benson	23:26	45:54
Yaeger	24:50	49:69
Foster	24:38	52:97
Zeigler	25:05	49:97

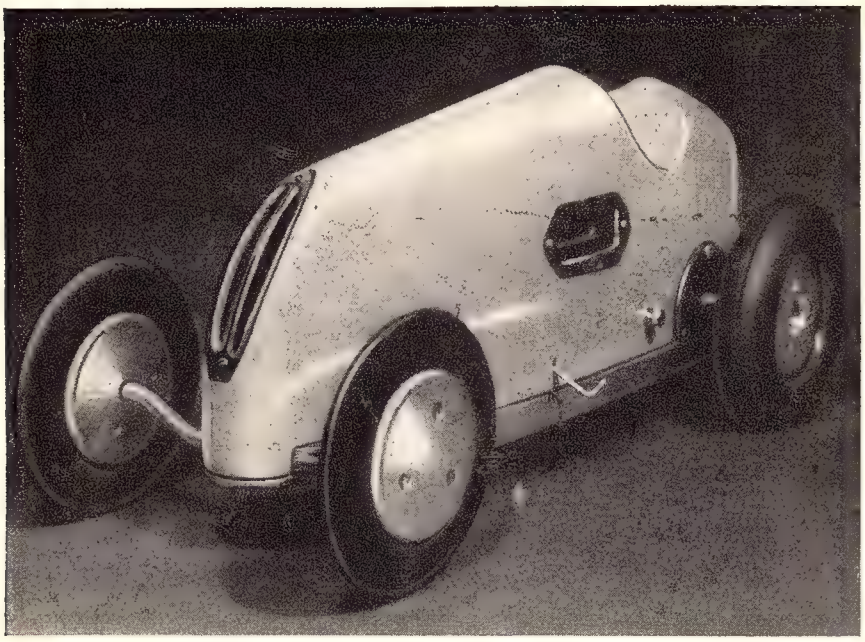
A total of 23 trophies and a generous amount of merchandise were awarded as prizes to all entries, each contestant receiving more in actual value of merchandise than his $2 entry fee.

The Salina Boys found racing a little difficult here due to the altitude. (*Speeds attained here cannot compare with those set at lower levels.*) We understand that Goedde has diesel trouble in Salina and he seemed to have the same trouble at Denver. Those Salina Boys are really swell fellows and were appreciated by the Denver gang. Because of the weather, they were undecided about coming, but being the good sports that they are, they took the chance. The Denver boys will soon pay them a visit and see what they can do on their track. The same goes for the Pueblo Club, another bunch of real sports.

The Denver Club runs on a 72 ft. circle cable track and welcomes any visitors to race with them on Saturday afternoons and Sundays. Track is located at 5500 North Washington St. The boys also thank the officials and others who worked so hard to make this meet a success, and to Dick Werthen, club member, for the fine pictures accompanying this article.—*A. J. Skinner, Sec.*

Photos by Worthen

Several shots of the Denver Boys. 1—Scene at Race Track. 2—Hal Yaeger. 3—Benson on Starter. 4—Al Skinner. 5—Lee Zeigler. 6—Cars in Pit. 7—Forrest Rees & Car. 8—Pusch on Starter. 9—Zarlengo. 10—Fox in deep study. 11—Contestants at track. 12—Zeigler on Starter.



BEHIND THE SCENES

A Winner Designs a Winner (Above)

Indianapolis, Ind. (Spcl.)—Joseph Olender, noted model race car enthusiast and holder of many trophies won in competition all over the United States, is one of the collaborators in the design of the newest entry in the field of gas powered, proto-type model race cars, the Speedway Pacemaker, now being manufactured by the Standard Machine Works of Indianapolis.

Joe has worked up quite an enviable record for himself in the past few years with his small but powerful cars in what is undoubtedly one of the fastest growing hobby fields in our country today. He was one of the first to push the speeds of the "proto" race car over the 100 mph mark and has gained recognition as a consistent winner.

The new Speedway Pacemaker is proclaimed by some of the leading hobbyists as the most promising car in the field today.

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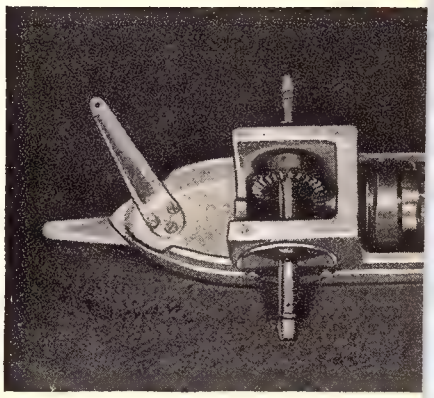

The Speedway Pacemaker will b
will include the chassis, body,
tank, coil, switch, condensor, s
wheel. The car is set up 100 p
The electrical equipment is asse
bridle brackets are included.
the only items necessary to cor

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to mount an engine in a race c
assembled to that point. This
can be taken out to the track f
struction necessary. We can
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a track, and able to compete w

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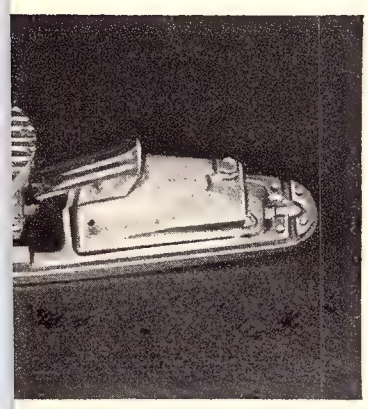

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12. Ignition Switch
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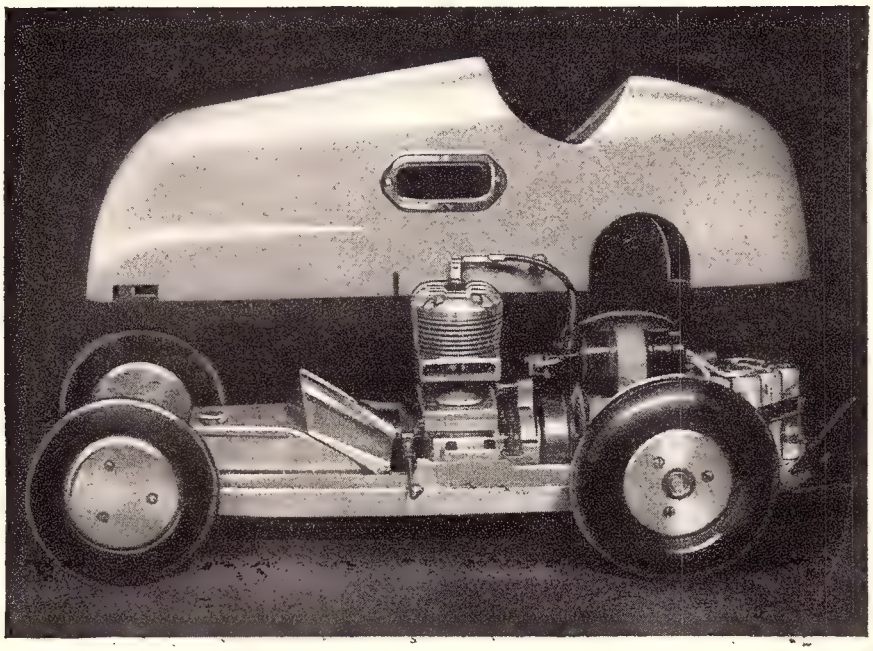

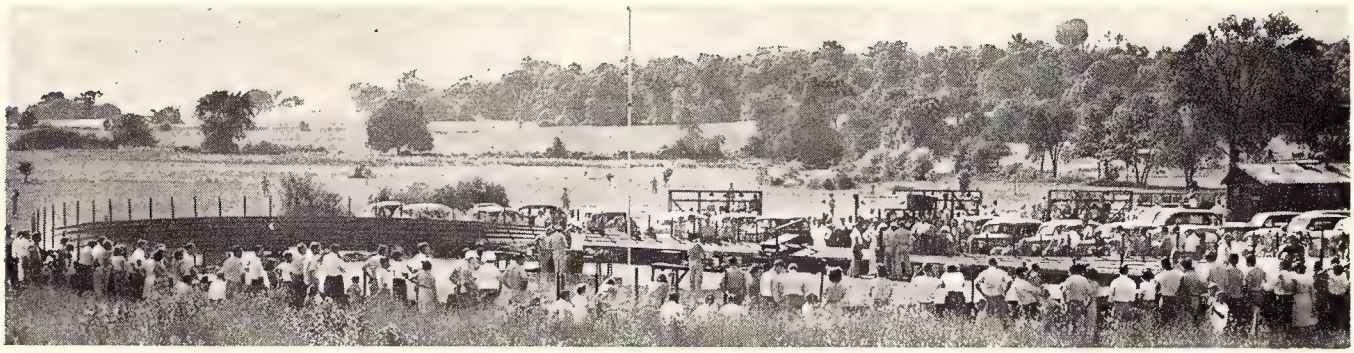

Photo by Leo Barnes

Milwaukee Model Race Car Association Rail Track at Greendale, Wisc. (Milwaukee suburb).

MILWAUKEE RAIL RACING

By BILL (front drive) DECKER

PASS me another bottle of Schlitz, Ma . . . Ahhhhh, mmmmm! Well, old man Decker finally crawls out of the haze of burning rubber from his front drive and decides it's time for another bit of news from down Milwaukee way. So with Junior tucked in for the night and the wife busy trying on a new hat, I'll attempt to get a bit of news in the writing. *How much did you say that hat cost? Holy smoke, I can almost get a new motor for my old boiler for that much!*

. . The weather has been so good to us out here that we almost kill a guy for beefin' about the weather man making it too hot. As I look back over the past Sundays, I can't recall a day that we were rained out. (Move East, California.)

With the old rail track better than new and the cars all hot and not bothered, we have been having some swell races every Sunday. Yours truly built up a front drive job with a Hornet and took it to the Nationals for its first run. Their track was nice and new and banked like the side of the wall in your house. Well, she did pretty good, but back on the home field where the bank isn't quite so high, it was kinda smelly. All I could get it to do was burn rubber trying to get traction. After about 25 laps, I could call time and get a fast qualifying time, but in a race on rail, that's no good. You gotta get out and go right away or be left behind. And that's just where I was most of the time. Think I'll put that gear back on the right side for next year or hang a 20-lb. weight on the front end.

The rest of the boys have been doing some nice time, that is for rail. It surely is good news to hear of the new rail tracks going up over the country. We're all anxious to hear what kind of time some of these red-hot cable boys can do on rail. They have been giving us the sleeve laugh when they hear our speeds. T'aint so easy as it looks. Course, maybe us rail guys don't know how to run a car, but we are all anxious to learn. We got rail in our blood out here and we love it! Best of luck to all youse guys building a rail track. We know you'll like it once you get the hang of it.

Al Manteufel has been leading the boys in the Streamline Division and Ralph Ganske has really got the Conventional clicking. Erv Kohloff, a brand-new member this year, has been right on Al's tail in points, with one of those D&M Specials. Seems like my friend, Merrill Madsen, was swamped with inquiries about the car and where it could be bought. Sorry if I mis-led you guys in my last article. All machined parts can be had for this car but it is not assembled and I wouldn't advise a beginner to tackle one. There is quite a bit of work to do in getting it all assembled right with the adapters and everything on. It is like I mentioned, an experimental car. Only 40 sets of parts were made with a few extra parts for replacements. Hope this straightens this question.

It seems that models are not enough to satisfy the hunger of racing for some of the rail boys. Several have branched

Photo by Leo Barnes

Action during the Feature Race on the Milwaukee Model Race Car Association's Rail Track. Timer in Stand —Elmer Riemer. Left to right—Bill Starwick, Al Manteufel, Joedy Loschaivo of Chicago, John Weithofer and Ralph Ganske at starter.

out and are actually building midgets. I saw Jimmy Thompson's midget and wow —is it a honey! If it runs as good as it looks, it will be a hard car to beat! Good luck, Jimmy! Clyde Rohrer has gotten the bug as well and is busy as a bee on his. Bill Starwick, who is well known now in the midget field, is well on his way to getting a midget for next year. All of these boys assure me that this doesn't mean they are not going to race models any more. No sir, they like their models too!

Just in passing, I mentioned how nice it would be if I had a midget for next year. Boy, I thought the boiler downstairs had blown up, but it was my wife! She said that if I so much as buy a cotter key for a front wheel for one, she and junior were going to take a trip . . . to Reno! Well, I can dream, can't I? There is one part of that midget that I have got now, and know they can't take away from me. That's the most important part . . . the nut that holds the steering wheel (me, that is).

My best buddy Ray ($9.00 a quart) Zeigler came out one Sunday last month and cranked up his D&M, gassing everyone including himself at the starting roller. When he passed out, he let the car go and it turned in a new all-time Milwaukee track record of 12.04. Old $9 claims it was the crushed banana seeds that did it in the fuel. Seems that some hot shot from the coast got the boys all worked up over some fuel that smelled like crushed oranges. Now everyone is running around like mad, crushing everything that he can squeeze a drop of liquid from, and trying it in his fuel. The real secret is to age your fuel. You know the old saying, "there's no fuel like an old fuel". I sprung this on the boys, and after laying off work for a few days to recuperate, I was as good as new again. Ralph Ganske holds the conventional record here with 12.43. Nice going, Ralph!

We cannot charge admission at our location, but we did pass the hat one Sunday after the races and when it was returned we found $25 in it. Not a bad idea, eh?

Point standings up to and including Oct. 31st follow:

STREAMLINE DIVISION

Car #	Name	Car-Motor	Points
7A	Al	Manteufel, Richter-Hornet	1200
78	Erv.	Kohloff, D&M-Hornet	1065
71	Ray	Ziegler, D&M-Hornet	825
6	Ray	Jens, Richter-Hornet	823
13	Frank	Horvath, Richter-McCoy	580
39	Bill	Starwick, Richter-Hornet	405
7	Al	Manteufel, Richter-Hornet	320
45	Joe	Kosler, Own-Hornet	250
1	Elmer	Riemer, Richter-Hornet	230
71A	Ray	Ziegler, Richter-Hornet	220
38	Bill	Starwick, Richter-Hornet	65
72	Clyde	Anderson, Dooling-Cyclone	50
99	Ted	Richardson, Richter-Hornet	40

CONVENTIONAL DIVISION

69	Ralph	Ganske, Dooling-Hornet	1195
4	John	Wiethofer, Dooling-McCoy	718
59	Jack	Jaeger, D&M-Hornet	597
12	Eddie	Bortz, Dooling-Hornet	120

Fastest Conventional Time, Ralph Ganske, Dooling Hornet, 12.38, 72.70 MPH. Fastest Streamliner time, Ray Ziegler, D&M Hornet, 12.04, 74.75 MPH.

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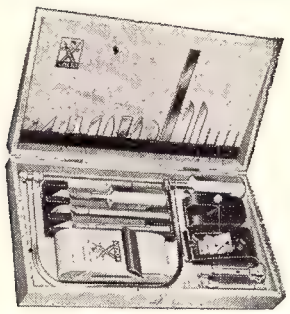
SPECIAL MODELERS TOOLS



No. 85 X-acto Tool Chest—3 all-metal knives; assortment of blades; saw; sander; stripper; planer, 2 drill holders; 10 drills; 6" steel ruler; complete in wooden chest, $12.50. (Illustrated)

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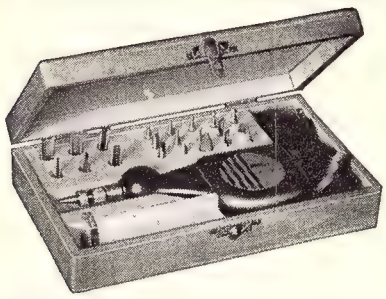

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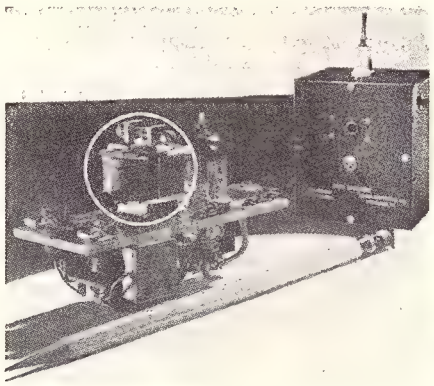

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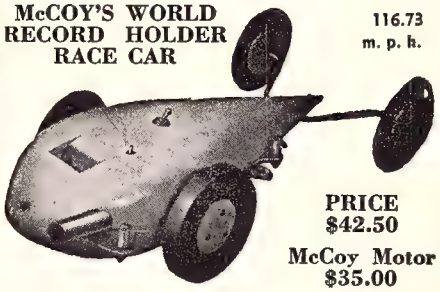

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COILS

SINCE the advent of model airplane engines, the bulk of the trouble experienced in their operation has been considerably curtailed. Mechanical difficulties have been eliminated through sound engineering and research. Ignition trouble, usually being 90% of these difficulties, has been whittled down to a relatively smaller percentage. Extensive research and development in the electronic field has advanced model engine performance to the position it is in today. Unfortunately however, only *some* of the ignition coils on the market today are the results of this research and development. It has been found through actual field tests that when engines were blamed for being balky, it was the ignition system really at fault, the coil in particular! Some coils would operate well only under ideal conditions, when flight batteries were used for one or two flights, then the engine would sputter and miss and eventually cut out completely. *How soon a coil will wear down the batteries* and *how hot a spark can a coil deliver* are the questions that spurred us on to conduct this survey.

IGNITION coils on the market today for use with model airplane engines are really proving themselves. There are approximately fifteen known coils available, some of which are very light in weight, others comparatively heavy, some of them large and some small. Several of them have prongs projecting from each end and others are flat on the ends. Yet all of these coils operate your engines in use today. How efficiently they operate is the *unknown* and *questionable* factor. Until the present, there has never been such information released to model builders. Model Craftsman, in line with its policy of presenting important informative facts, that *you*—our readers—can digest and profit by, decided to conduct such a survey on ignition coils and present to you the complete facts and pertinent figures for your benefit.

Some coils appeal to the model builder more than others. A few of them are condemned because they apparently "wear out" the batteries faster than others. Some are praised to the high "King of Thermals" because they throw a 3/8" spark on a set of dead pen-cells. All of us have seen or heard this and some of us even quote the expressions ourselves. Yet, to be perfectly honest to ourselves, we had no definite facts on the efficiency of these coils, for we had no way of learning them! We at Model Craftsman, being model builders ourselves, understand these conditions, and knowing how receptive these facts would be, carefully planned the Ignition Coil survey which is presented in this issue.

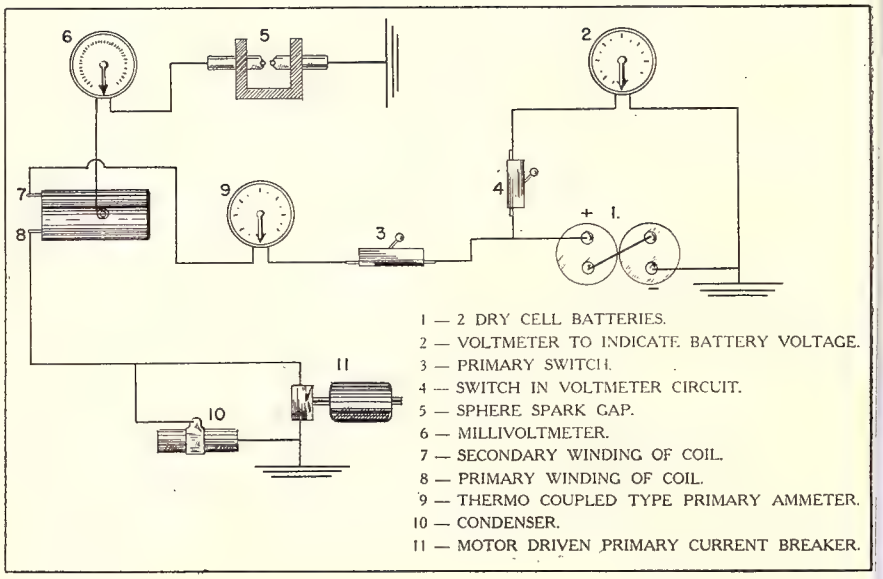
First, let's discuss ignition coils in general—what they are and how they operate. Ignition coils or high-tension non-vibrating types as they are also known, are the type in general use. Their primary function is to supply a spark to the spark plug at the proper instant in order to ignite the compressed fuel in the engine cylinder. The coil itself is only one part of the entire ignition system. The other components are the batteries, condenser, wires and their connections, spark plug and ignition timer point. Each component in itself is important and is a great factor in the total efficiency of the system. Before going into coils, we will briefly touch each of these components.

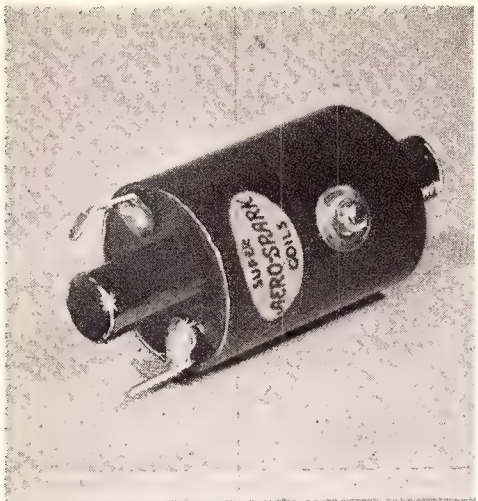
BATTERIES—Most ignition systems operate on three volts, therefore two 2½ volt batteries are normally used. Two large booster batteries are used for initial starting and two smaller cells for flying. Pen cells, intermediates, large size, packet batteries—all of the dry cell types are in general use in the model for flying. Each type is satisfactory depending upon the factors involved—importance of weight, duration of engine run, etc. Normally, the larger the battery, the longer the battery life. Wet cell batteries have recently appeared on the market and are being used quite extensively in the control line speed models.

CONDENSER—This in effect, acts only as a storage place for the induced current of the primary circuit, and with certain limits acts to eliminate the spark at the contact points of the ignition timer. Condensers are normally supplied with the coil or are recommended to match the individual coils for peak performance. The range in condenser capacity averages .03 microfarads with 400 volts direct current.

WIRES—The wiring used in any hook-up of the ignition system is usually of the multi-stranded insulated wire. Stranded wire with at least five strands is sufficient, although seven or more strands are more desirable to resist crystallization. The wire should always be well insulated and oil resistant. Cloth or plastic coated wire is the most desirable due to its flexibility. Efficiency of the circuit depends upon the type connectors and length of the wires. Wire lengths should be kept to a bare minimum to reduce unnecessary electrical resistance.

Test circuit used throughout the Coil Survey.

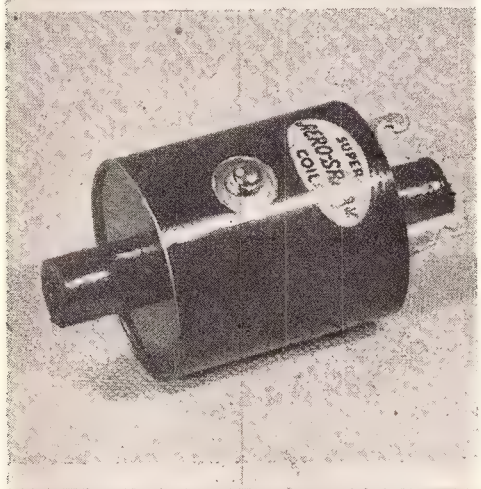




Aero Feather

Wt. 1.435 Oz.

Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	1.7	2.9	.6	.070	7000
7,500	1.5	2.9	.8	.070	7000
10,000	1.2	2.9	.9	.070	7000
12,500	1.0	2.9	.9	.070	7000
15,000	.9	2.9	.8	.070	7000
19,000	.5	2.9	0	.070	7000



Aero Quality

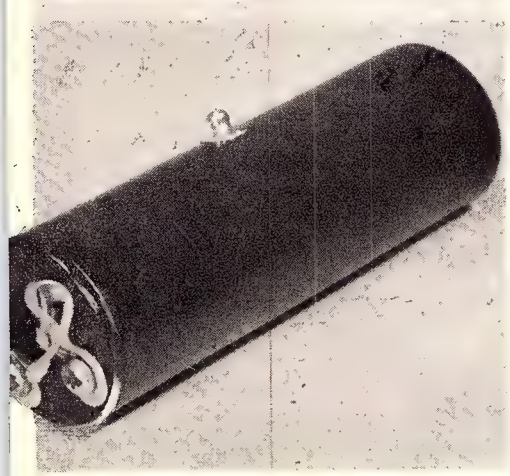
Wt. 1.925 Oz.

Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	2.2	2.9	.5	.070	7000
7,500	1.8	2.9	.85	.070	7000
10,000	1.4	2.9	1.1	.070	7000
12,500	1.2	2.9	1.1	.070	7000
15,000	1.1	2.9	1.0	.070	7000
23,000	.2	2.9	0	.070	7000

Air-o Sparkoil

Wt. 2.275 Oz.

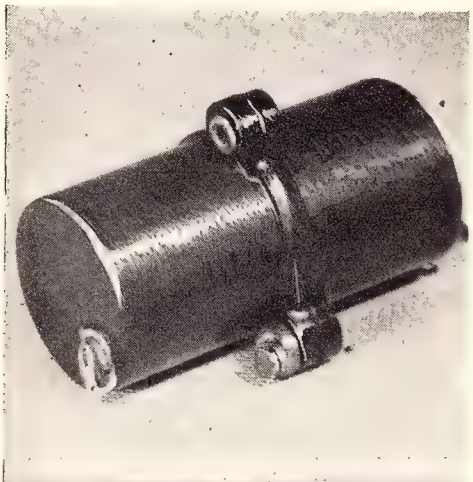
Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	2.6	2.9	.15	.070	7000
7,500	2.5	2.9	.3	.070	7000
10,000	2.3	2.9	.3	.070	7000
12,500	2.2	2.9	.2	.070	7000
15,000	2.0	2.9	.1	.070	7000
21,000	1.4	2.9	0	.070	7000



Arden

Wt. 1.61 Oz.

Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	2.8	2.9	.3	.070	7000
7,500	2.5	2.9	.5	.070	7000
10,000	2.1	2.9	.7	.070	7000
12,500	2.0	2.9	.7	.070	7000
15,000	1.8	2.9	.6	.070	7000
18,400	1.0	2.9	0	.070	7000



Austin Hotscha

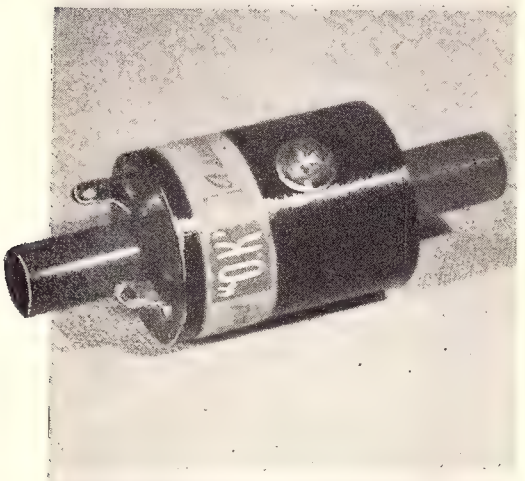
Wt. 2.17 Oz.

Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	2.7	2.9	.6	.070	7000
7,500	2.4	2.9	.7	.070	7000
10,000	2.0	2.9	.9	.070	7000
12,500	1.8	2.9	.9	.070	7000
15,000	1.6	2.9	.8	.070	7000
19,000	1.1	2.9	0	.070	7000

Electron

Wt. 2.275 Oz.

Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	2.8	2.9	.3	.070	7000
7,500	2.6	2.9	.5	.070	7000
10,000	2.3	2.9	.6	.070	7000
12,500	2.1	2.9	.7	.070	7000
15,000	2.0	2.9	.7	.070	7000
19,000	1.5	2.9	0	.070	7000



Herkimer OK

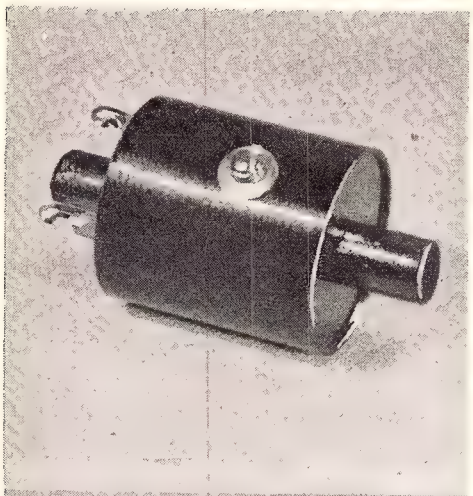
Wt. 1.585 Oz.

Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	3.3	2.9	.5	.070	7000
7,500	2.7	2.9	.8	.070	7000
10,000	2.2	2.9	1.5	.070	7000
12,500	2.0	2.9	1.6	.070	7000
15,000	1.7	2.9	1.6	.070	7000
22,000	.3	2.9	0	.070	7000

Jr. Motors

Wt. 2.03 Oz.

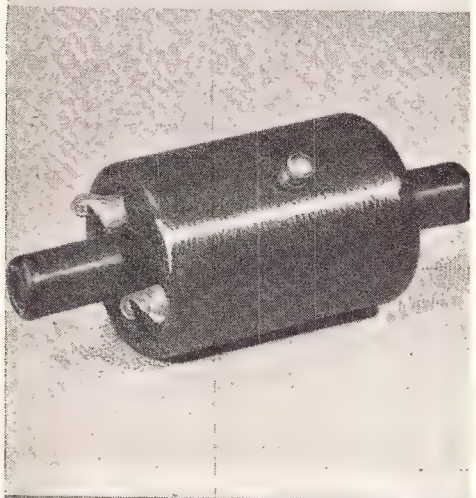
Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	3.6	2.9	.2	.070	7000
7,500	3.2	2.9	1.0	.070	7000
10,000	2.8	2.9	.6	.070	7000
12,500	2.5	2.9	1.0	.070	7000
15,000	2.3	2.9	1.2	.070	7000
21,700	1.1	2.9	0	.070	7000



Lite-ning

Wt. 1.435 Oz.

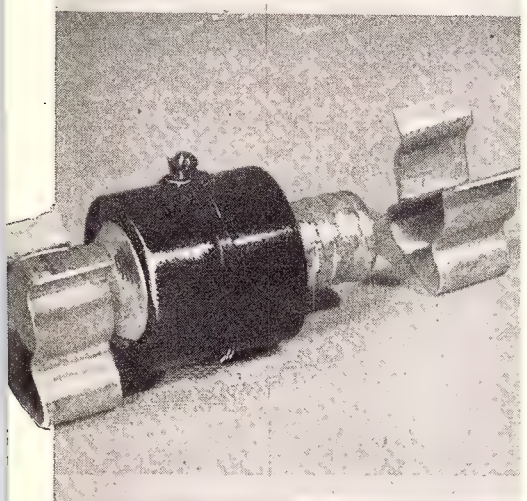
Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	1.8	2.9	.2	.070	7000
7,500	1.5	2.9	.4	.070	7000
10,000	1.2	2.9	.5	.070	7000
12,500	1.1	2.9	.5	.070	7000
15,000	.9	2.9	.5	.070	7000
20,000	.5	2.9	0	.070	7000



Rogers

Wt. 1.855 Oz.

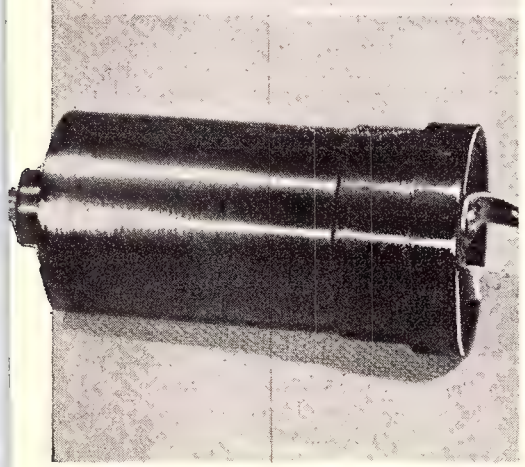
Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	3.6	2.9	.4	.070	7000
7,500	3.2	2.9	.6	.070	7000
10,000	2.5	2.9	1.1	.070	7000
12,500	2.2	2.9	1.6	.070	7000
15,000	2.0	2.9	1.7	.070	7000
21,250	1.0	2.9	0	.070	7000



Smith Competitor

Wt. 1.47 Oz.

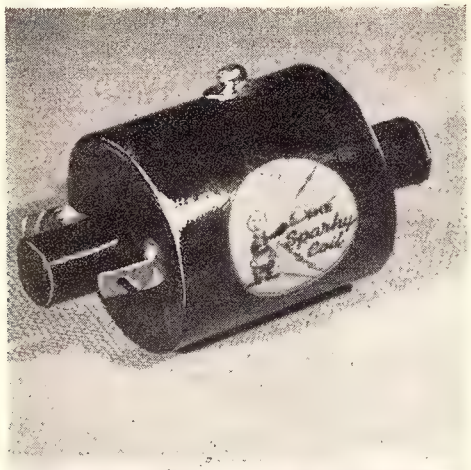
Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	2.2	2.9	.3	.070	7000
7,500	1.8	2.9	.5	.070	7000
10,000	1.4	2.9	.7	.070	7000
12,500	1.2	2.9	.6	.070	7000
15,000	1.1	2.9	.5	.070	7000
18,200	1.0	2.9	0	.070	7000



Smith Firecracker

Wt. 2.625 Oz.

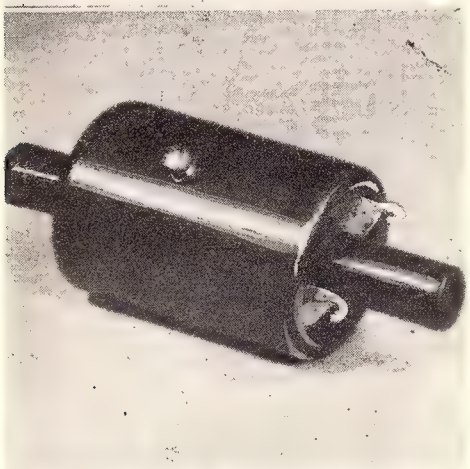
Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	3.0	2.9	.3	.070	7000
7,500	2.6	2.9	.6	.070	7000
10,000	2.2	2.9	1.0	.070	7000
12,500	2.0	2.9	.9	.070	7000
15,000	1.8	2.9	.8	.070	7000
20,000	1.2	2.9	0	.070	7000



Sparky

Wt. 1.995 Oz.

Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	2.7	2.9	.4	.070	7000
7,500	2.4	2.9	.7	.070	7000
10,000	2.1	2.9	.9	.070	7000
12,500	1.9	2.9	1.0	.070	7000
15,000	1.8	2.9	1.2	.070	7000
23,750	.5	2.9	0	.070	7000



Syncro Coil

Wt. 1.855 Oz.

Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	3.0	2.9	.4	.070	7000
7,500	2.5	2.9	.9	.070	7000
10,000	2.0	2.9	1.3	.070	7000
12,500	1.7	2.9	1.5	.070	7000
15,000	1.5	2.9	1.4	.070	7000
21,750	.5	2.9	0	.070	7000

Wilco

Wt. 2.03 Oz.

Sparks Per Minute	Primary Amps. Running	Primary Volts After Test	Secondary Milli-Amps.	Sphere Gap	Peak Sec. Voltage
5,000	3.8	2.9	.15	.070	7000
7,500	3.4	2.9	.2	.070	7000
10,000	2.8	2.9	.2	.070	7000
12,500	2.6	2.9	.75	.070	7000
15,000	2.4	2.9	.8	.070	7000
20,000	1.2	2.9	0	.070	7000

It is well to point out that while lengths are kept to a minimum, there should also be sufficient slack near the connections in the event of jarring of any component in the system.

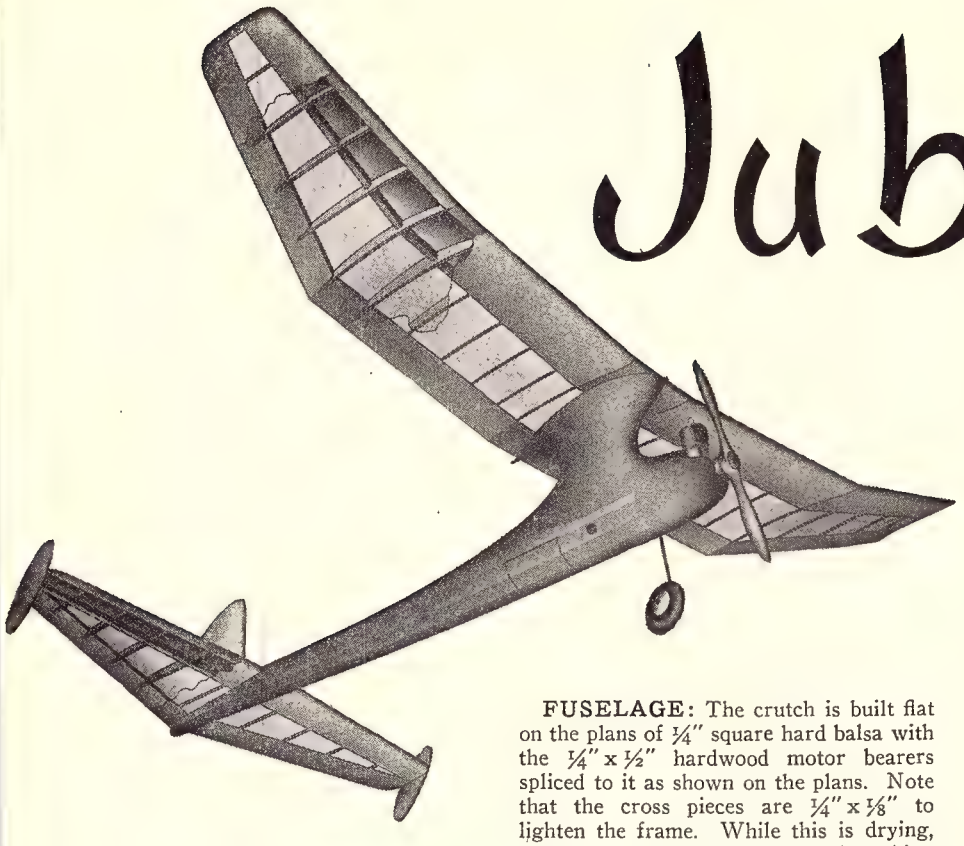
WIRE CONNECTORS—Wire connectors should always be positive to allow for an uninterrupted passage of the current through the system. Soldered connectors are the best. The wire ends that are to be soldered should always be tinned with solder, then twisted together before applying the hot soldering iron. Only enough solder to coat the two wires should be used—excess solder in the form of a bulb is useless and sometimes covers a poor connection making it unnoticeable.

SPARK PLUG—This component takes the most beating in the entire system. It charges temperature within a matter of seconds and transmits a spark from the hi-tension circuit to the ground, several thousand times per minute. There is one favored plug on the market today that is extremely efficient as far as spark plugs go. Spark plug size is determined by the engine manufacturer and the gap is determined by the engine owner, dependent upon the ignition system and the type of use the motor is going to serve. A spark plug gap of (.015) fifteen thousandths of an inch is the normal gap. Spark plugs should always be kept clean and free from carbon formation for efficient operation. Scraping the plug is the most common practice, although sand-blasting seems to be the most appropriate since carbon formations can be removed between the insulating porcelain and the grounded frame as well. Because of the high operating speeds and temperatures of model engines today, spark plugs are taking greater abuse and require more generous servicing and care.

IGNITION TIMER POINTS—These are the contact points that make and break contact in order to allow the voltage to build up in the coil and then to break down, causing a spark to jump the spark plug gap. Contact points are usually made of extremely hard steel (tungsten and the like) to allow for wear and to resist carbon formation or "pitting" as it is commonly called. These points should always be kept clean and free of dirt. They are best cleaned by honing a

(*Continued on page 38*)

Jubilee



By BOB HATSCHEK

HERE'S a ship that flew right off the drawing board! Though it isn't the only job of its type in the air today, the JUBILEE is one of the best pylon models yet developed. The design goes back to shortly before the Pencil Bomber era when a similar class A job was built. Then came the elimination of the cross-section rule and a six foot P.B. was developed from the little ship. With the advent of the current rules, the JUBILEE left the drawing board as a Class B Pencil Bomber with a thickened pylon for the required cross-sectional area. The one wheel gear reduces drag and yet permits perfect take-offs with the wide-tread balancing rudders.

The wing is light and strong and uses one of the best airfoils yet developed for models, the N.A.C.A. 6409. The straight-tapered square-ended tips were used for simplicity. Our experience shows definitely that they are just as efficient at low speeds as any other shape.

Construction of the fuselage is quite conventional and very strong. The wing and stabilizer construction is somewhat out of the ordinary and permits a lighter, stronger frame with a true airfoil section.

Plans are presented one quarter size as this is most convenient for enlarging. Most of the curved parts are shown full size. If you follow directions, it will be unnecessary to enlarge wing and stabilizer drawings. It will be necessary to draw full size only the crutch, pylon and rudder.

For certain wide engines, such as the DeLong 30 and Phantom P-30, it will be necessary to widen the fuselage a little bit, but this should prove no trouble to you.

FUSELAGE: The crutch is built flat on the plans of ¼" square hard balsa with the ¼" x ½" hardwood motor bearers spliced to it as shown on the plans. Note that the cross pieces are ¼" x ⅜" to lighten the frame. While this is drying, the pylon is made and attached, making certain it is perpendicular to the crutch. Pylon formers and wing platform should be attached at this time.

With the structure still on the plans, the upper keel of ¼" x ⅜" is attached. Use a few temporary vertical braces to hold it in position while the ¼" x ⅜" uprights are being cemented in place. When completely dry, remove from plans.

With the gear already bound in position, you may attach the firewall. The lower keel of ¼" square balsa should now be attached in same manner as upper keel. Do not attach any stringers until the ignition units have been installed.

The coil should be placed between #1 and #2, the ignition timer between #2 and #3, the battery box and dethermalizer timer between #3 and #4. These units are all mounted below the crutch. By this arrangement, all ignition wires may be made as short as possible.

Lastly come the stringers, sheet fill-in around the pylon, cowl block and hinged battery box door. Covering will be taken up later.

WING AND TAIL: These components may prove slightly difficult to build flat, so we suggest the following by which the original was constructed: Build the spar with proper dihedral, then—in your hand—securely cement all ribs in place. Next attach the trailing edge, which should previously have been sanded to proper cross section. Leading edge comes next and is put on in like manner as the trailing edge. Use plenty of pins and you will have no trouble.

Allow the structure to dry thoroughly, bevel the leading edge and apply the 1/16" sheet balsa to the top of wing. This should be well cemented as it contributes much to the strength of the wing. Stabilizer should be built in similar fashion, with both rudder and balancing rudders being self-explained.

COVERING: The entire frame must first be completely and thoroughly sanded, contributing more to a good covering job than any other factor.

The pylon should be tackled first, covered with silk put on wet with plenty of pins. Be extremely careful to get even curvature on both sides and keep silk from touching the pylon formers.

The balance of the fuselage is also covered with silk or silkspan, in either case applied wet. The wing and tail of the original were covered with double tissue, an innovation for which we are indebted to Henry Struck. Just cover the parts completely with tissue, the grain of which should be just opposite the normal direction, and spray with water. When this has dried, merely cover the parts again with the grain running normally this time, and again spray. When completely dry, dope the model. Three or four coats will provide an almost indestructible covering. As a matter of fact, the only damage ever done to the covering of the original happened when it was hit by another model on the rampage.

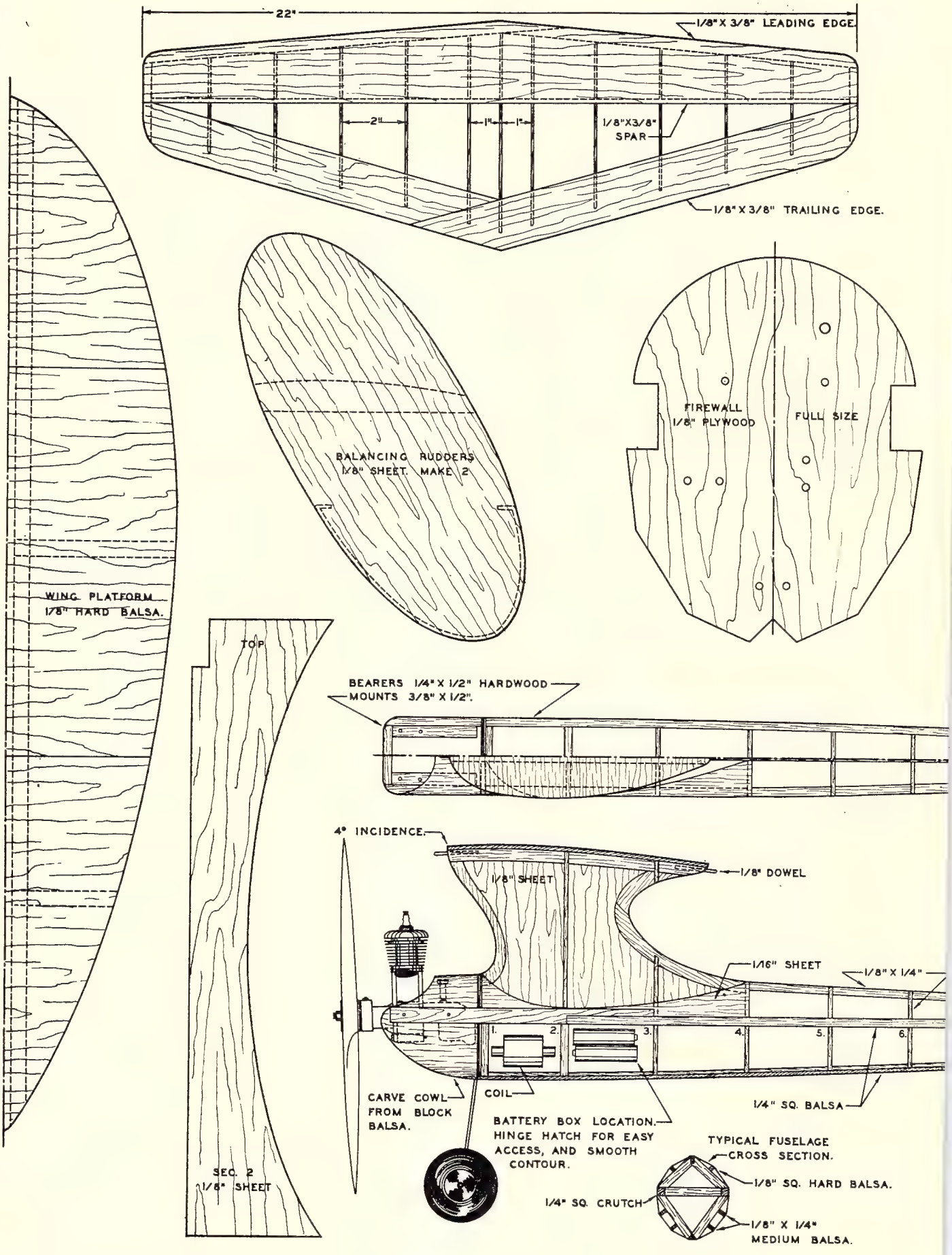
MISCELLANEOUS: The Jubilee is truly a Class B model, but it is still small enough to mount any large Class A engine and climb quite well. Projected wing area is 320 square inches and therefore the model must weigh at least 22.4 ounces regardless of the power plant used. When the engine used is of .299 cubic inch displacement, it must weigh 24 ounces.

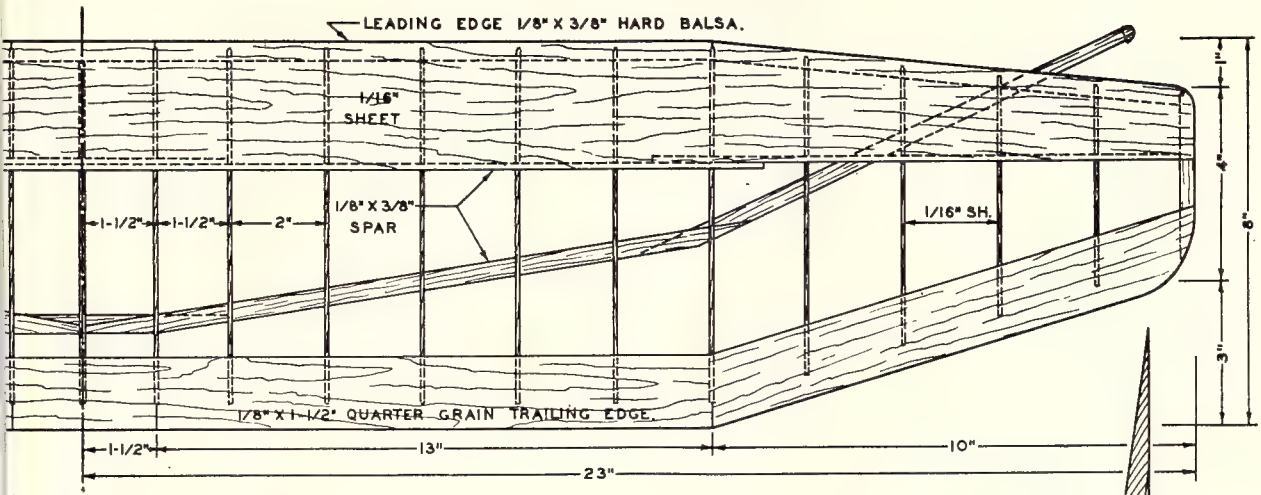
A dethermalizer was used on the original, and we feel that this is really advisable. A simple stabilizer type with an Austin timer pulling the actuating pin is best. Much research (about a dozen models equipped with similar dethermalizers) proves that the tail should pop up about 35 to 40 degrees. Anything less will cause the ship to spin.

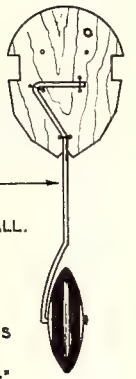
ADJUSTING AND FLYING: Your model should balance at 50% of the wing chord and should glide well if the wing and tail angles are built in properly. The first hand glides should be straight, and full power should not be used for the first eight or ten flights. All adjusting should be done with the rudder tab and stabilizer angle.

The original has been flown in either direction in both powered flight and glide, thus proving its inherent stability, but it gives maximum performance when flown to the right under power and to the left in the glide. No side thrust will be necessary to get this type of flight, just a bit of left rudder.

She's all yours now, for many a day's sport or contest flying!

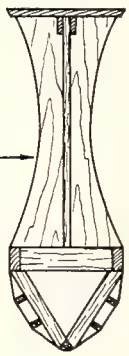

22"
1/8"X 3/8" LEADING EDGE.
2"
1"
1"
1/8"X3/8" SPAR
1/8"X 3/8" TRAILING EDGE.
WING PLATFORM 1/8" HARD BALSA.
BALANCING RUDDERS 1/8" SHEET. MAKE 2
FIREWALL 1/8" PLYWOOD
FULL SIZE
TOP
SEC. 2 1/8" SHEET
BEARERS 1/4"X 1/2" HARDWOOD
MOUNTS 3/8" X 1/2".
4° INCIDENCE.
1/8" SHEET
1/8" DOWEL
1/16" SHEET
1/8" X 1/4"
1.
2.
3.
4.
5.
6.
CARVE COWL FROM BLOCK BALSA.
COIL
BATTERY BOX LOCATION. HINGE HATCH FOR EASY ACCESS, AND SMOOTH CONTOUR.
1/4" SQ. BALSA
TYPICAL FUSELAGE CROSS SECTION.
1/8" SQ. HARD BALSA.
1/4" SQ. CRUTCH
1/8" X 1/4" MEDIUM BALSA.





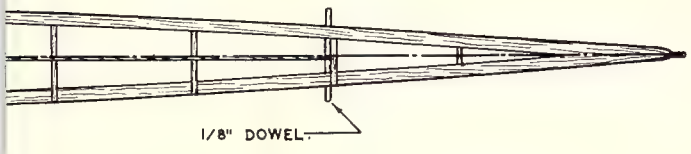
LANDING GEAR BENT FROM 3/32" WIRE.

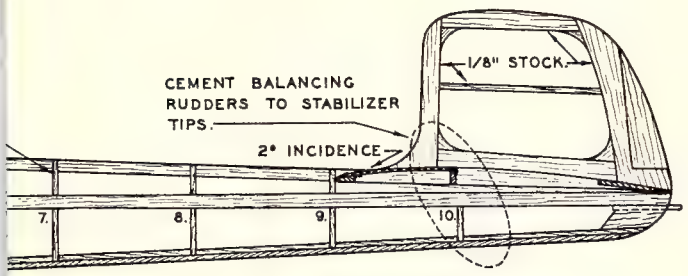
BIND AND CEMENT SECURELY TO FIREWALL.

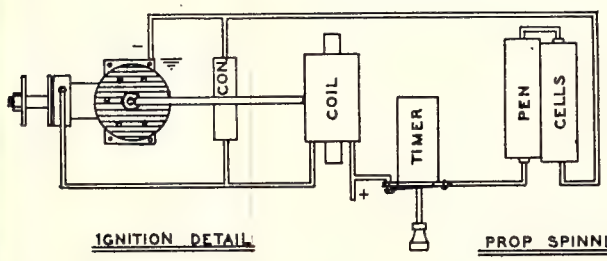


NOTE:

ENLARGE ALL DIMENSIONS 4 TIMES WITH DIVIDERS, OR GRAPH PAGE INTO 1/4" SQUARES, CORRESPONDING TO 1" SQUARES.

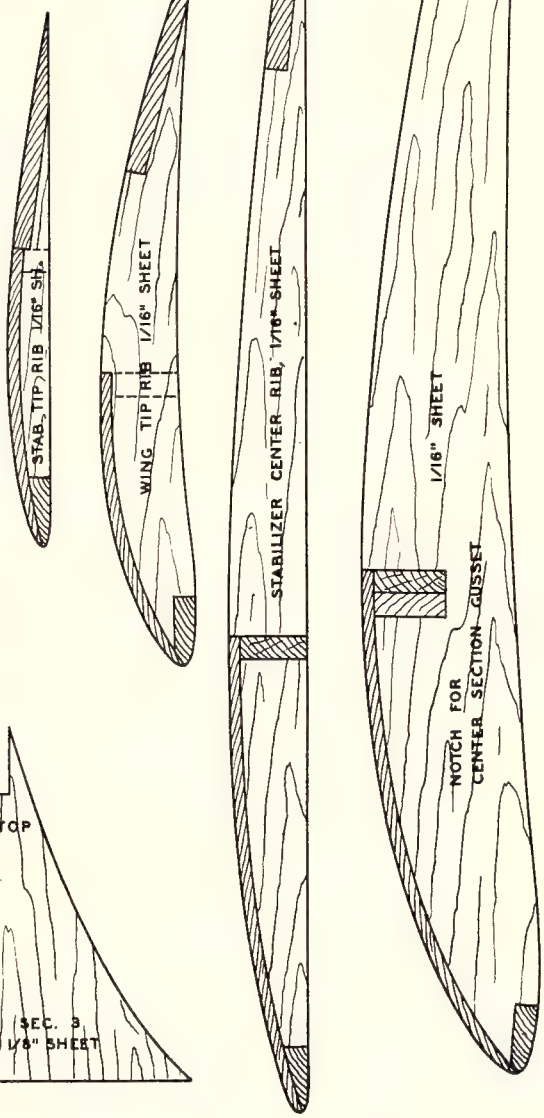


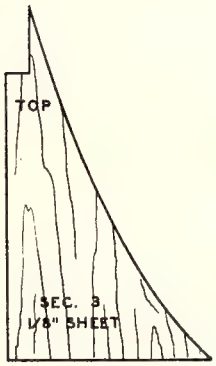




IGNITION DETAIL

PROP SPINNERS CLUB.





NOTE:

FIREWALL, BALANCING RUDDERS, PYLON FORMERS, AND ALL RIBS ARE FULL SIZE.

1/4 SCALE
CLASS "B"
AREA 320 SQ."
WGT. 24 OZ.

THE JUBILEE

DESIGNED BY BOB HATSCHEK
DRAWN BY DON MCGOVERN

COIL SURVEY

(*Continued from page 34*)

smooth surface on them with a fine honing stone. The size of the gap between these points are very important. Too large a gap will make difficult starting and missing at high RPM's. Too small a gap will make extremely hard starting and back-firing of the engine.

Timer point gaps of different engines are set at the factory and the clearance given with the instructions which accompany each engine. Manufacturers usually go through extensive research on ignition timing and it is recommended that you carefully follow their instructions for easy starting and maximum power.

COIL TESTS—Now for the explanation on the method of testing the different coils in this survey. It was decided to have these tests conducted by your editor and an impartial electrical engineer; in this particular case, a Professor of Electrical Engineering of a nearby university was called upon to assist in the preparations of this survey.

In order to conduct this practical and yet fair test, we rounded up considerable equipment. We desired to show the following: (1) Primary Voltage — the required volts to operate the coil. (2) Primary Amperage — amount of amperes (current) flowing through the primary winding of the coil (amperage drain on the battery). (3) Peak Secondary Voltage — highest voltage reached in the secondary winding under a fixed condition of operation. This point is reached just before the air or gas between the spark plug electrodes breaks down by ionization and then of course, the spark jumps across and the secondary impulse which has been built up in the coil discharges. This is the electrical pressure (volts) which causes a spark to jump across the spark plug gap. (4) Secondary Milli-Amperes —the generated quantity of current intensity in the secondary winding of the coil. This shows the *reserve* of ignition capacity left in the coil while it is functioning under a given fixed condition of operation and also indicates the spark fatness. Included is a schematic diagram of the electrical hook-up which was used for making the tests.

From our recent engine survey (August & September 1946) we found the different RPM's at which most engines operated, and decided to test each coil at these same RPM's. Tests were conducted then at 5000, 7500, 10,000, 12,500 and 15,000 RPM, and then finally at an RPM where the coil broke down and would not generate the spark to jump the gap.

A sphere spark gap was used in these tests, set at a gap of .070 (seventy thousandths). This is equivalent in magnitude to a miniature spark plug set at .015 and operating under normal running temperatures and conditions on most engines.

On the adjoining pages are the different coils tested, with the individual weights and readings that were found. The highest figure under the column headed "Sparks per minute" is the RPM where each coil "broke down" and where the Secondary Milli-Amperes diminished to zero. All coils were tested at the RPM's previously mentioned. The Primary Amperage, Primary Voltage and Secondary milli-amperes are read in whole numbers and decimals thereof. The higher the amps, the greater the drain on the batteries at that particular RPM. The Sphere Gap is read in thousandths of an inch. The Peak Secondary Voltage is read directly. Note that the Peak Secondary Voltage remains constant, the reason being that 7000 volts are required to cause a spark to jump the .070 sphere gap. The figure of 7000 volts was obtained from purchased data from the Bureau of Standards. It should be pointed out here that you will note the primary voltage remained constant. This is due to the fact that two sets of dry cells were used and continually recorded 2.9 volts. These sets of batteries were interchanged after a few tests so that our voltage reading would remain at 2.9 volts. This assured us that the reading on one coil would be *comparative* with any other found in the survey. Let us stress this one point as we did in our engine survey—these coil tests give *comparative readings!* From these readings, we can determine which coils draw more amperage in order to operate at given engine speeds. We can also tell what reserve of ignition capacity is left in the coil at that RPM. We can therefore determine the most efficient coil for our own individual purpose. These facts taken into consideration with the weight and size, can be the factor with which many dealers may allow you to determine which is most satisfactory to fulfill your requirements.

Here is a question that will arise at this point—just what will the effect be on the readings if pen cell batteries or intermediate batteries are used? The answer is simple—just as long as the smaller batteries have an amperage in excess of the amperage drain listed in the primary amperage column, the coil will function the same. When the amperage falls below the figures listed, then the coil will not deliver the same spark. This accounts for your engine missing while using weak batteries. As a matter of fact, since the ampere drainage decreases with the RPM's, the coil will perform better at the higher RPM because of the additional reserve in amperes within the batteries. This condition accounts for the fact that an engine will sometimes rev' up when it passes a certain speed, even though worn-out batteries are being used.

By studying these reports, you may determine which coil is the most efficient at the particular speeds your engine will be running. Using the average RPM of 7500, you may determine which coil is superior by noting the ampere drainage (Primary Amperes) and the reserve (Secondary Milli-Amperes). The less the drainage and the greater the reserve, the more efficient the coil. The breakdown speeds will not mean too much, since there is considerable doubt that any model gasoline engine today attains the high speeds of 20,000 RPM and better.

This Model Craftsman Coil Survey is another of a series that we plan to present from time to time. It is our hope that this coil survey meets with the same magnaminous response that our recent engine survey received.

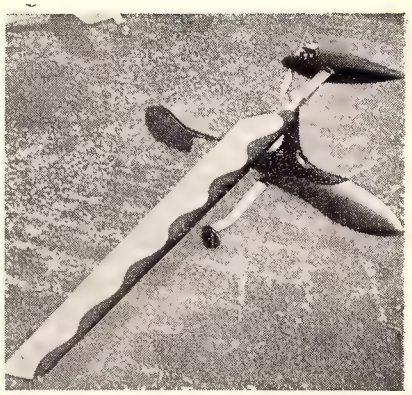


Photo by Messner

Original design Auto-Gyro seen at a recent Eastern Contest. A P-30 engine is mounted in a nacelle, the thrust derived whirling the connected rotor which in turn supplies the lifting force to raise the model.

EAST CHALLENGES WEST!

WE read the very interesting but not too informative articles about the use of our pylon, and also heard of the astounding speeds chalked up on the West Coast without using any positive means of knowing how fast the airplane is actually flying. We too have witnessed speeds of 136 and 145 MPH with a model airplane with a master hammer thrower at the controls, but felt that we couldn't honestly claim any records established by such flying technique.

Mammy and Pappy Herbert of Westchester Hobbies, Inc., White Plains, N. Y., having talked over the prospect of such a contest with the members of the Sky Devil Club for the past year, finally secured the support of Ernie Babcock, Sr. & Jr., and a few other Eastern Model sportsmen, and *hereby challenge the very best the West Coast has to offer.* The statement was made in a popular National magazine that the devilish pylon was conceived to bring the West Coast speeds down to that of the East.

"Pappy" Tom Herbert is known throughout the East Coast and all model circles as an honest, unbiased contest director and model builder. Pappy, Ernie Babcock and the Eastern boys are issuing this challenge out of true sportsmanship to actually determine the East-West Champion. A mutual contest to be held on mutual grounds. This contest will be held for speed and stunt only. No beauty! No flying scale! Trophies and medals *only* as prizes.

Rules as follows:

1. Internal combustion engines only.

2. AMA rules as to class distinction I to VI inclusive.

3. Optional length of lines listed below.

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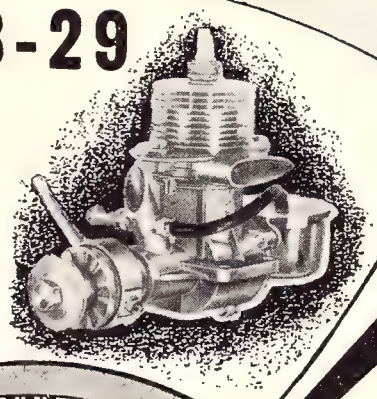
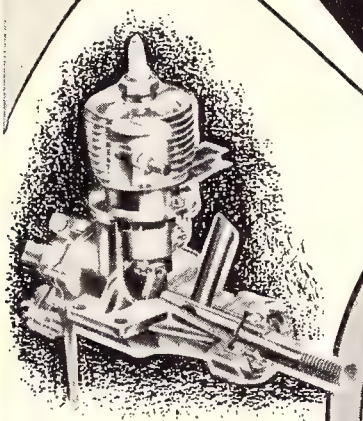


ALL OK *in name in performance*



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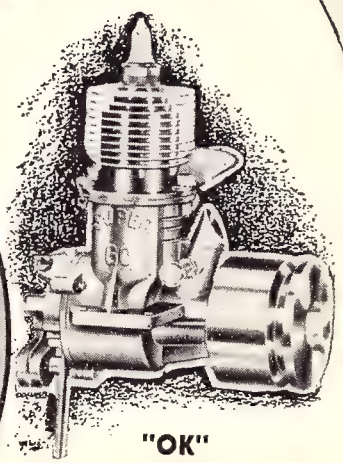

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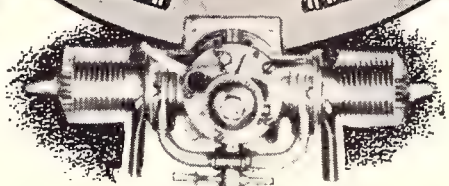
"60" Raceway and Marine engines are block-tested at speeds exceeding 10,000 R.P.M. Piston precisely fitted with necessary extra clearance for top speed performance. Both crankshaft and fully, machine balanced flywheel are precision "Keywayed." Complete with spark plug, bakelite tank and neoprene fuel line. $23.00



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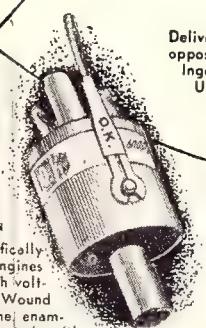

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THE MOUNTED E-2 Fleetwind

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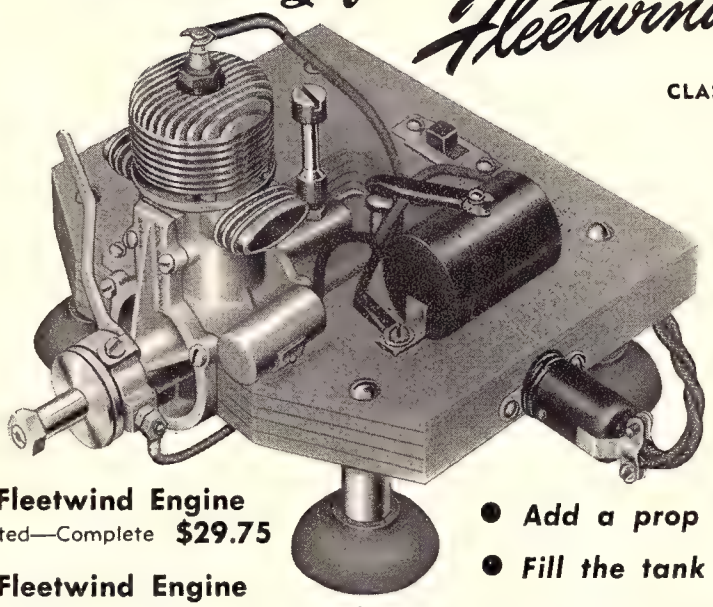

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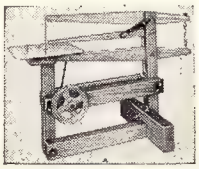

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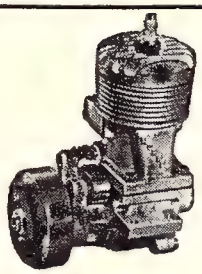

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(*Continued on page 49*)

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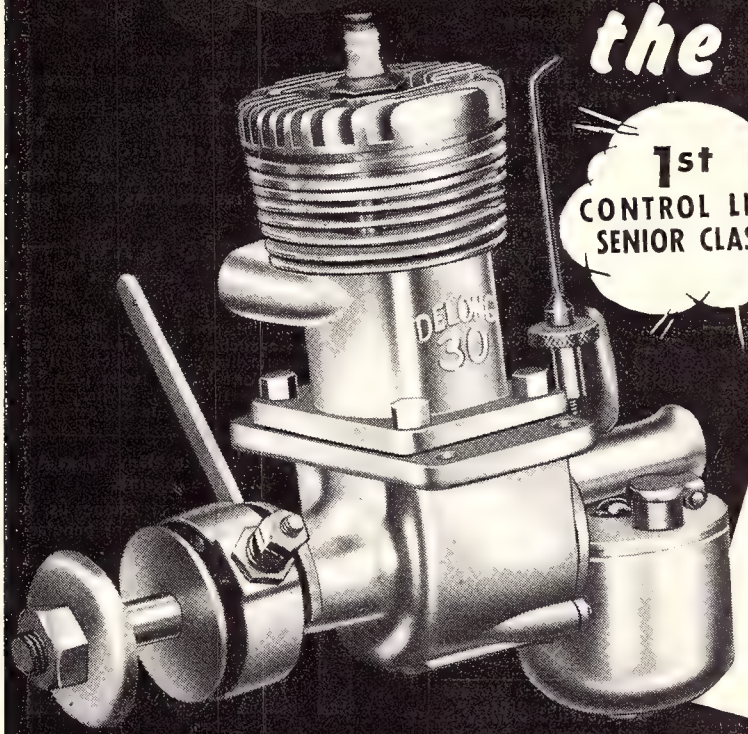

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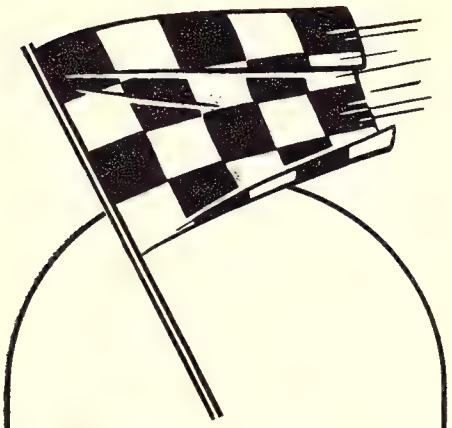

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(Continued from page 23)

more even basis. Results follow:

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Charles Lamb	112.07
Roy Torrey	111.24
Wilmer White	111.11
Ed. Baynes	109.62
Lou Stone	108.95
Art Silva	108.43
Andy Anderson	107.39
W. Romley	107.37
Ed. Filippetti	106.76
Dick McCoy (non-comp)	113.49
CLASS B SPUR GEAR	
W. Graves	104.04
Nehi Haliburt	104.04
Tom McAttee	102.15
R. Vanderhoff	101.92
Robert Hill	101.92
Dr. Oldhom	101.80
E. Hopkins	101.46
Lloyd Snider	100.89
J. Levovsky	100.78
CLASS A PROTO	
Wilmer White	106.88
W. Woodward	100.89
Andy Anderson	100.44
B. Janovics	97.82
E. Yost, Sr.	97.40
Ted Frances	97.29
James Frances	96.77
Dick McCoy (non Comp)	102.38
Charles Lamb (non Comp)	101.92
CLASS B PROTO	
Capt. Alexander	92.11
M. Bartlett	92.02
Joe Gryalva	91.74
George Hook	90.72
Emil Yost, Jr.	87.80
HOT ROD CLASS	
Wilmer White	83.95
Don Shauver	81.89
Larry Miller	64.60

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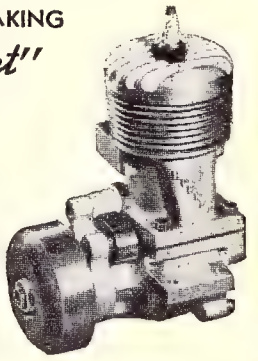

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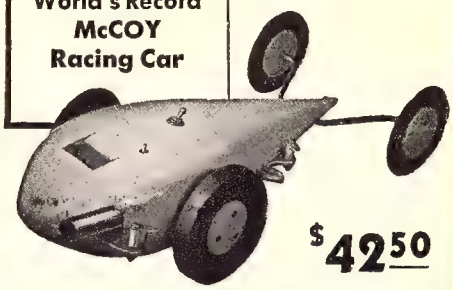

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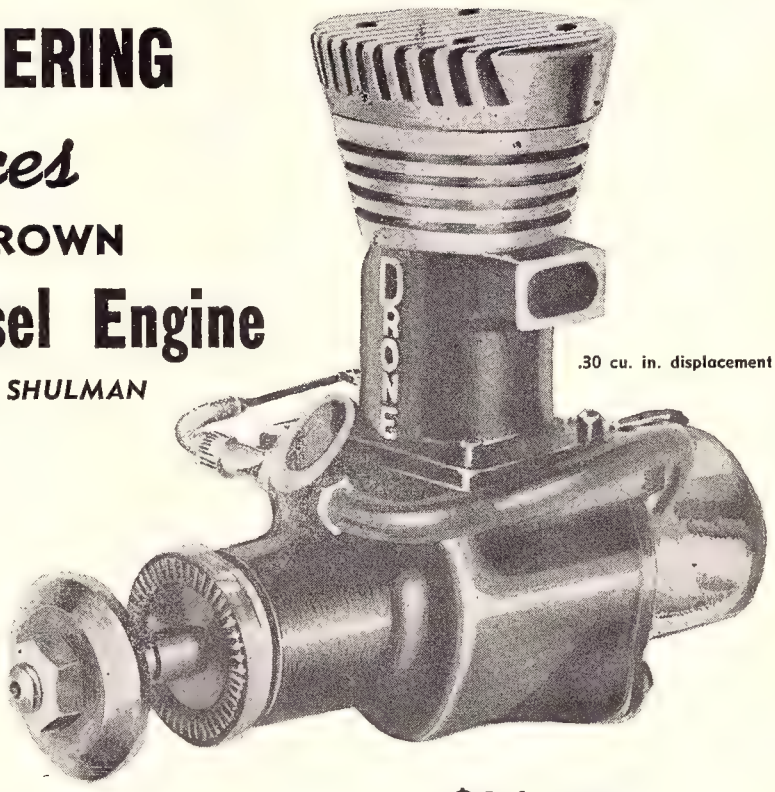

.30 cu. in. displacement

The Startability — simplicity of operation — power — and RPM will amaze the model world. Just think! No more boosters, batteries, coils, condensers, wires, switches, high tension leads and no compression change necessary with the new DRONE "B"ee Diesel Engine.

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$21.50

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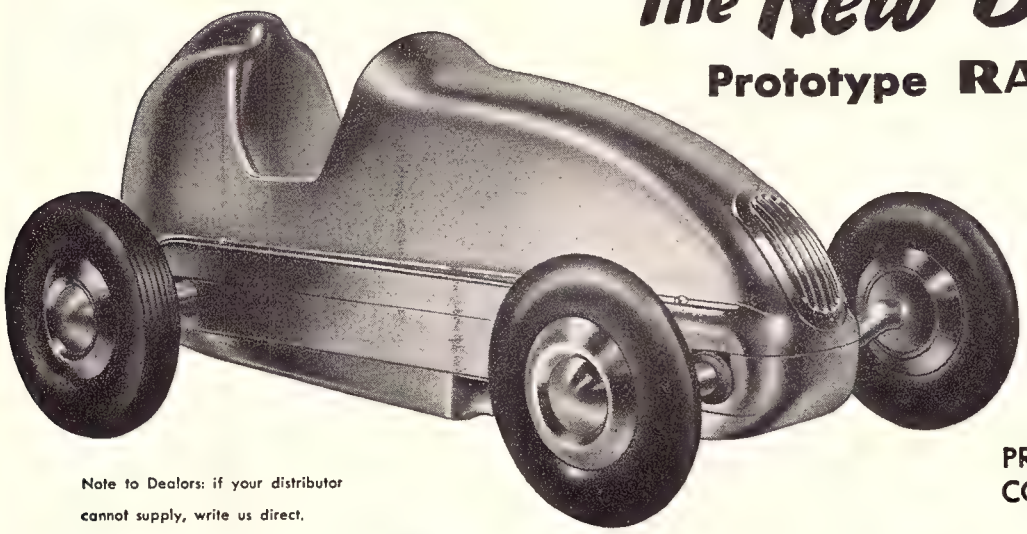
Prototype RACE CAR



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DOUBLE UNIVERSAL AND FLYWHEEL INCLUDED • KNEE ACTION FRONT END SUSPENSION

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• HOTSHOT KITS, Attention owners of scale and Tinplate layouts! These are just the cars for getting around those sharp radius curves. Scale in detail, realistic in appearance. This is the answer to owners of Tinplate who have been wanting to build a passenger train. Accurately cut parts from flawless wood stock. Discarded tinplate trucks may be used. OPEN or CLOSED END COACHES, BAGGAGE and COMBINATION cars .....each $3.95

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• Track layer $1.50
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24 in. radius circle $1.00
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A 5 pole 12 volt universal Motor in the OO or S-Gauge class. Specially designed armature produces greater starting torque. Current drain only one ampere. Speed 8000 R.P.M. Shaft diameter ⅛ in.
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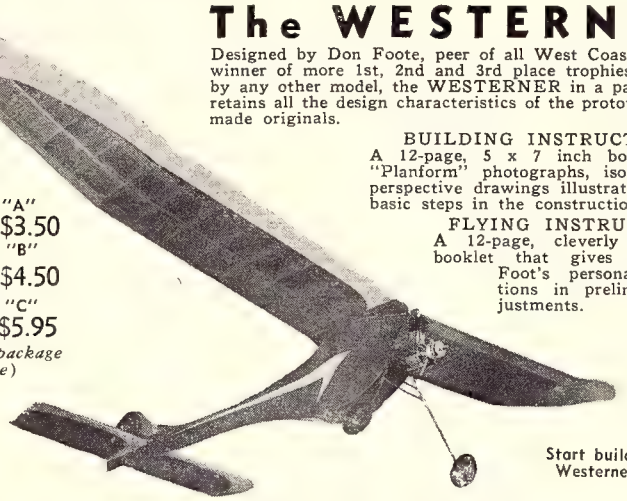

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RAILROAD CLUB NEWS

(*Continued from page 4*)

frame all the way from Merced, Calif., to Santa Barbara via the S. P. R. R., a distance of roughly 400 miles. Due to its condition, the crummy had to be the last car of the drag, not capable of pulling another car behind it. It arrived on Sept. 3rd, and with much excitement among the Channel Club members, was moved *via truck* under police escort to a vacant lot near their Club layout. We can just see those boys now, all proud as peacocks and bubbling over with enthusiasm, with the real "McCoy" for their club meetings. Guess the housing situation is really getting rough!

Converting HO to "S" Gauge

Q.—How can an HO pike be easily converted to S Gauge, particularly in regard to the track?

A.—One method would be to nail the new ⅞" gauge ties directly over the HO ties, filling in with loose ballast.

HOLLYWOOD MODEL
TREES & SHRUBS

Add more life to your pike! Natural growth from Calif. mountains, carefully processed, dyed and coated to give natural appearance. Inexpensive, long-lasting, washable. In HO, O and Extra large sizes. FREE illustrated folder shows complete line of trees and shrubs and money-saving Kits.

Sample Kit No. 320 (HO size). 42 pieces, including orange, apple, shade, tall, and pine trees, hedges, bushes, shrubs, 2 oz. jar green enamel, imitation grass, U. S. mail and storage boxes. Regular $6.08 value, only $5.00. Money-back guarantee.

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Your dealer can supply you, or we will ship direct, postpaid. Send check or money order. Dept. MC-3.

BERT WELCH COMPANY
128 South Hoover Street, Los Angeles 4, California

LIVE STEAM LOCOS
PASSENGER CARRYING
1946 CATALOG

ALL CASTINGS AND RAIL for ¾", 1½" and ¼" (O gauge) STEAM LOCOMOTIVES, and all parts for their construction, are now available.
DRAWINGS and WRITTEN INSTRUCTIONS by MARTIN S. LEWIS (using his original "Step-by-Step" method of construction) available as follows (In Bound Form):
¾" scale, classes 4-6-4 & 4-8-4 .....$3.00
1½" scale, classes 4-6-2 & 4-8-2 ..... 3.00
¼" (O gauge) classes 4-6-4 & 4-8-4 ..... 3.00
STEAM DRIVEN FEED WATER PUMPS for ¼", ½", ¾" and 1" scales 3.00
NEW CATALOG listing CASTINGS and all parts for the steam driven pumps, BOILER FITTINGS, Bolts, Nuts, Taps, Dies, Drills, Tools and ALL NEEDS FOR MODEL BUILDERS. Send 25c for your copy.

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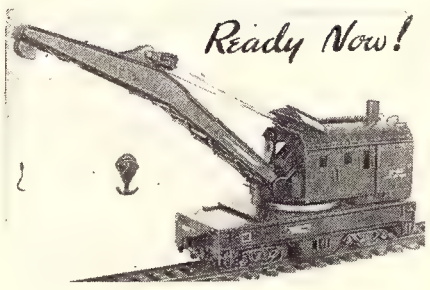
Ready Now!



"HO" WRECKING CRANE
COMPLETE WITH TRUCKS
$2.00 At your dealers—By mail add 15c for postage.

PERE MARQUETTE CABOOSE
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ALL IDEAL KITS CONTAIN COMPLETELY ASSEMBLED BRASS-WHEEL TRUCKS

SEND FOR OUR CATALOGUE 10c
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REFRIGERATOR CARS
Morrell
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St. Louis
$1.75 each at your dealers—by mail add 15c for postage

FOUR-WHEEL CRUMMY

(*Continued from page 11*)

spring hangers. Cut and file the journal frames from the same material. Journals may be filed from ¼" brass, held in place on the frame by the inside shoulder. Drill axle hole and also the three holes at the top edge of the journal frame where shown, for the three rivets fastening frame to side member. Use round head bank pins for rivets. Shackles are easily made by using a wire bent in a U shape, one side going through the hanger and the other through the spring loop. A small brass strip with holes drilled to fit the U shaped wire is slipped over it and the wire ends bent over to hold it in

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Easily built kits for beginners include everything required for a complete railroad. Send self-addressed envelope for full details.
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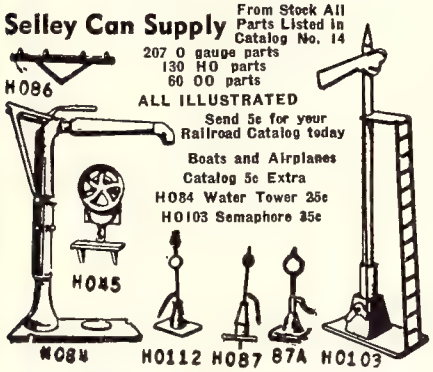

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FREIGHT CAR KITS
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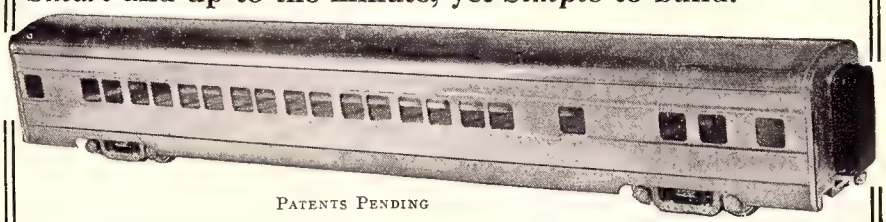
Streamliners in "S" Gauge
Smart and up to the minute, yet *Simple* to build.



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TRUCKS • CARSIDES • TRACK
So many "S" gauge enthusiasts have been clamoring for C-D locomotives, freight cars, and track material that we have decided to offer those parts which are NOW AVAILABLE, rather than wait until we can announce the complete kits. The loco parts available comprise most of the vital components of our 0-6-0 Pennsylvania Switcher. The few simple missing parts can be added later, or improvised in your own workshop.
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These S gauge locomotive kits are super detail, top quality throughout. Completely machined, drilled and tapped. Assemble with screwdriver in one evening. U.S.R.A. Prototype. Prices include BOTH 1st and 2nd sections comprising over 250 parts to complete the entire running gear, chassis, mechanism, valve motion, etc. Shipped postpaid by return mail.
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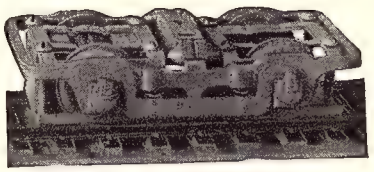

"S" gauge Diesel switcher truck shown. To be available in several other types in the leading gauges. Direct drive, high torque per-mag motors, single or twin, mounted within truck frame, entirely below floor
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$24.50 Assembled
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- *Chugs*
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Laying Out HO Pikes ..... Apr., May '45
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OO GAUGE

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O GAUGE

Motorized Wrecking Crane ..... Sept. '44

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Coal Breaker ..... Nov. '44
"Old Time" Railroad Station ..... Dec. '44
Station Platform Railings ..... Dec. '44
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Along the Tinplate Track ..... Monthly Feature

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Annual Index ..... May '45
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Helldiver, SB 20-1 (Prototype Dimensions) ..... July '44
Accipiter VI, Class D ..... July & Aug. '44
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"Scrappy," A or B Gas Model ..... Oct. '44
A De Luxe Glider ..... Nov. '44
"Elwy," Class C Gas Model ..... Dec. '44, Jan. '45
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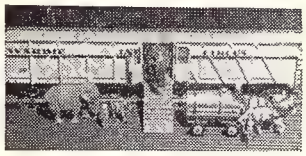

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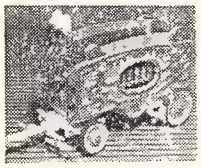

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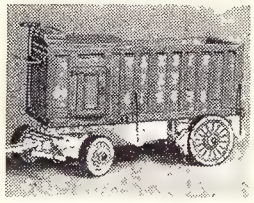

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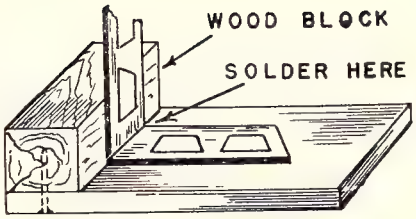

SOLDERING JIG FOR SQUARING CUPOLA

place. Attach one side member to the car, fit in the journals, put the axle ends in the boxes and then assemble the other side, placing the journals on the axles and attaching the other side frame.

We did not spray our model, but painted it with a fine camel hair brush and oil base paint, giving it two smooth coats. After your model is painted, install the couplers and marker lights, put a drop of oil in each bearing and apply decals and road numbers. Your "Crummy" is now ready to roll!

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EAST CHALLENGES WEST!

(*Continued from page 40*)

all builders for at least three months prior to date of contest.

Original bore and stroke only. Builder and helper may use original or stock fuel, and personally hop up own engines. Winners must disassemble own engines for checking by officials, after contest, and before presentation of awards. Stop watches to be calibrated in hundreds with sweep second hand. Six master timers to be selected from twelve master timers by both teams. Remaining timers to judge stunt events. Six selected master timers to time all speed events. One speed circle only.

If this contest proves successful, Pappy hopes it will be an annual event. Good luck, good flying. **Let's hear from the West Coast!** . . . *Contest Headquarters, Tom Herbert.*

(Model Craftsman thinks the idea real worthwhile and is eager to further the challenge to the point of having the meet actually take place. To stimulate the competition, we hereby offer to donate a large perpetual trophy which will go to the winning team. . . . Ed.)

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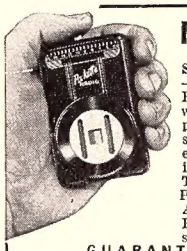
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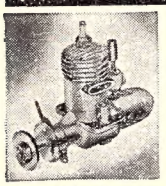

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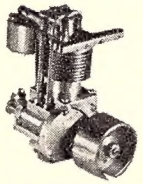

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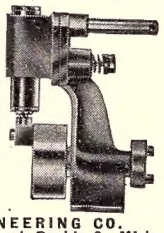

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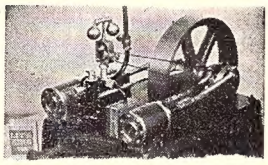

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Of The Model Craftsman, published monthly at 1309 Noble St., Phila. 23, Pa., for October, 1946.

State of New Jersey } ss.
County of Bergen }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Charles A. Penn, who, having been duly sworn according to law, deposes and says that he is the Publisher of The Model Craftsman and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher, Charles A. Penn, Ramsey, N. J.
Editor, Charles A. Penn, Ramsey, N. J.
Managing Editor, Robert W. Thompson, Ramsey, N. J.
Business Managers, none.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)
Model Craftsman Publishing Corp., Ramsey, N. J.
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3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)
None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and condition under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is ..... (This information is required from daily, tri-weekly, semi-weekly and weekly publications.)

CHARLES A. PENN.

Sworn to and subscribed before me this 20th day of September, 1946.

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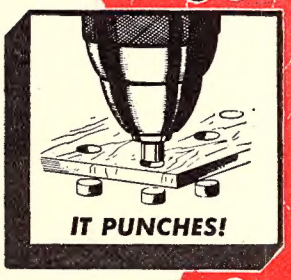

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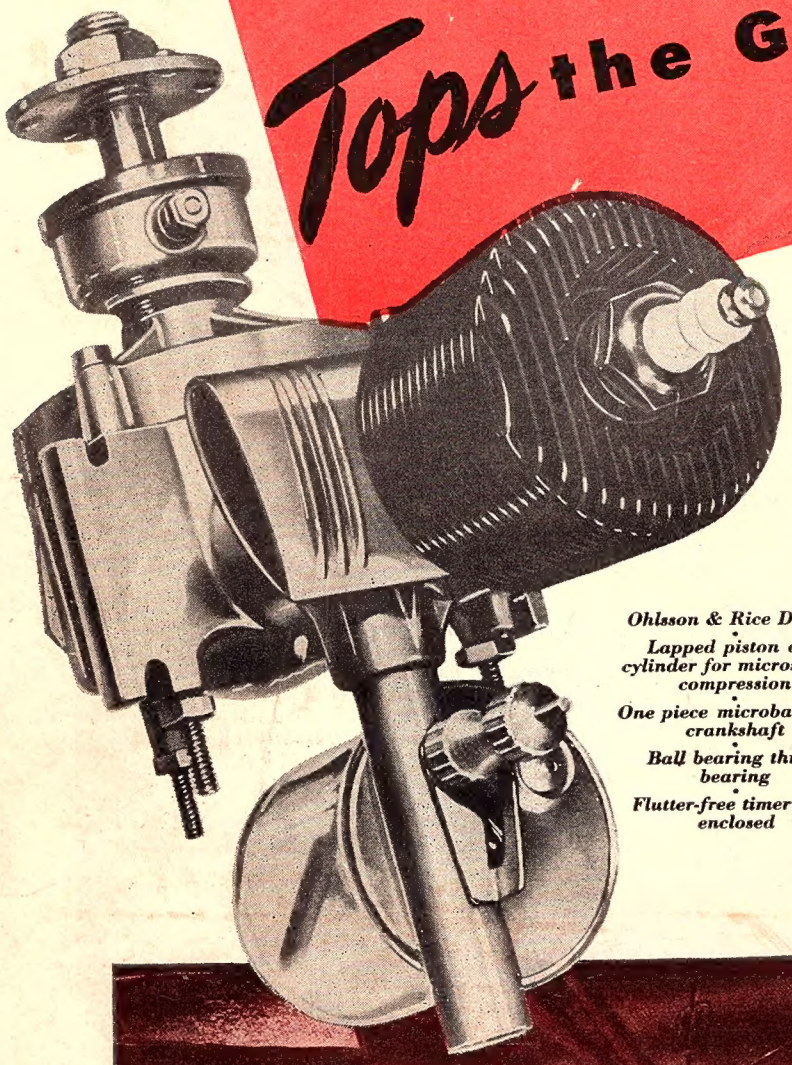

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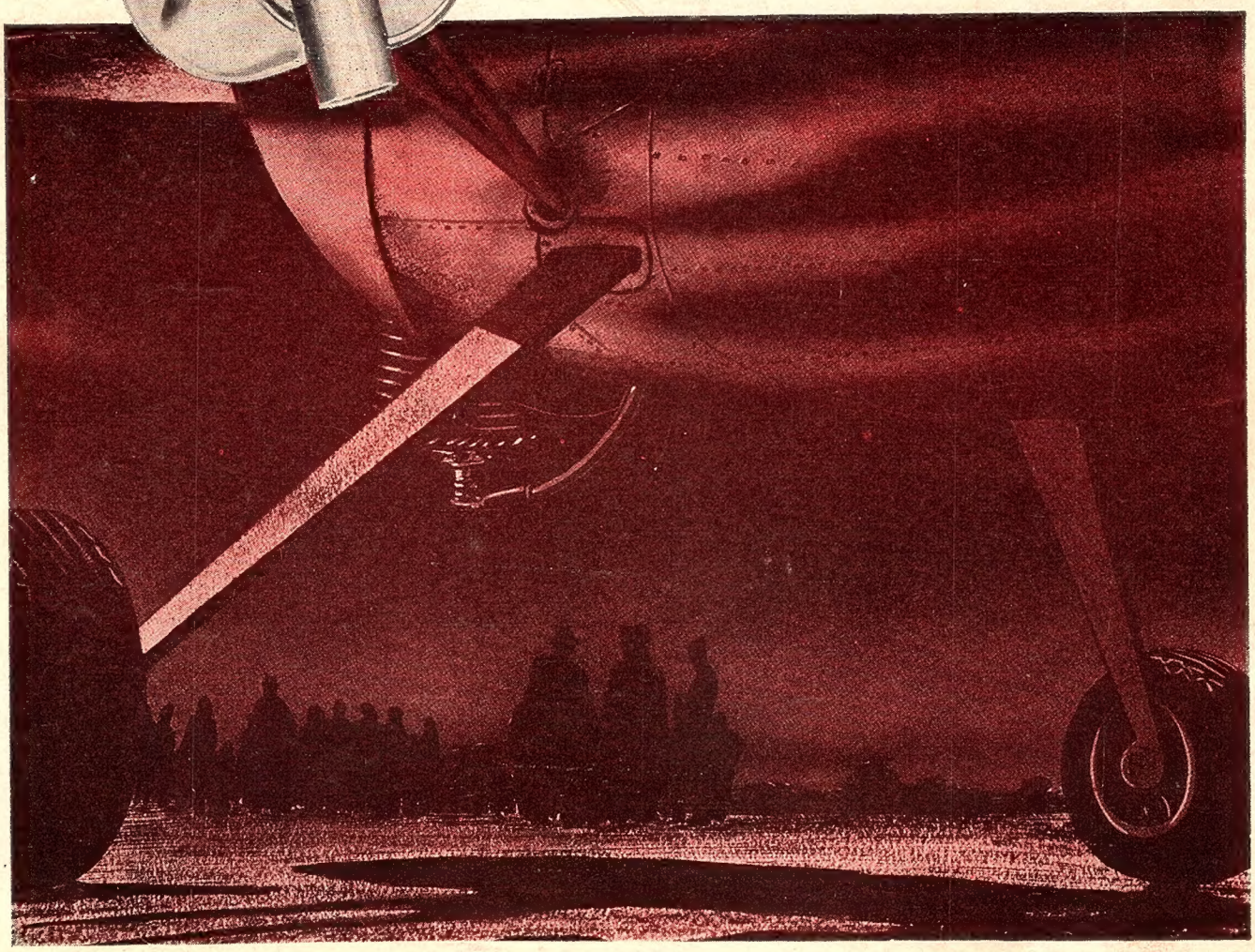
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